PRODUCTIVITY MEASURES FOR HEALTH AND EDUCATION SECTORS IN INDONESIA

MENNO PRADHAN AND ROBERT SPARROW

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Productivity Measures for Health and Education Sectors in Indonesia

Menno Pradhan and Robert Sparrow[1]

September 2014

ABSTRACT

This study analyses the relative efficiency of district public health and education service delivery in Indonesia over the period 2003 to 2008. We apply production frontier models to assess the efficiency of districts in achieving education and health outputs, and costs functions to assess the efficiency of public spending. The analysis combines data from the Ministry of Finance on district spending, Susenas household surveys, and health and education infrastructure indicators from the PODES village census.

The data show a strong increase in district health and education public spending, as well as service availability. Yet, we also see a large disparity in spending between districts in terms of per capita public spending, both within and between regions. To a large extent this is driven by relatively static characteristics of districts. However, there is some evidence of convergence in spending levels as well as scope for local policy changes to overcome initial public spending differences. This suggests that the central government transfers remain an important policy tool for equalizing investment in health and education in districts.

The analysis reveals substantial variation in efficiency across regions in Indonesia. Given the level of service delivery, district public spending per capita is on average relatively low in Java and Bali. In contrast, Sulawesi and Kalimantan are relatively less efficient in terms of spending, while in Sumatra spending efficiency by district governments has declined strongly since 2006. Districts in Java and Bali also perform well in terms of technical efficiency, as service delivery in these districts is relatively high, given the level of spending and available infrastructure.

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Askeskin	*Asuransi Kesehatan Masyarakat Miskin* (Health Insurance for the Poor)
FDH	Free Disposal Hull
Jamkesmas	*Jaminan Kesehatan Masyarakat* (Public Health Insurance)
NTB	Nusa Tenggara Barat
NTT	Nusa Tenggara Timur
OECD	Organization for Economic Cooperation and Development
PKH	*Program Keluarga Harapan* (Conditional Cash Transfer Programme for Families)
PNPM	*Program Nasional Pemberdayaan Masyarakat* (National Programme for Community Empowerment)
PODES	*Potensi Desa* (Village Potential Statistics)
PPF	Production Possibility Frontier
PSE	public sector efficiency
PSP	public sector performance
Susenas	*Survei Sosial dan Ekonomi Nasional* (National Social and Economic Survey)
TNP2K	*Tim Nasional Percepatan Penanggulangan Kemiskinan* (National Team for the Acceleration of Poverty Reduction)

Introduction

To accelerate poverty reduction, Indonesia established the National Team for the Acceleration of Poverty Reduction (*Tim Nasional Percepatan Penanggulangan Kemiskinan* or TNP2K) that leads the coordination and oversight of all poverty reduction programmes under the National Poverty Reduction Strategy. Vice-President Boediono chairs TNP2K, which includes all the government agencies responsible for the planning, financing and implementation of poverty reduction programmes.

An important element of the strategy is to ensure that all people of Indonesia have access to basic health and education services, both through demand and supply side policies. Programmes on the demand side include the Conditional Cash Transfers for Families programme (*Program Keluarga Harapan* or PKH) and the PNPM Generasi programme. Several studies have been conducted to investigate the effectiveness of these programmes. On the supply side, meanwhile, spending has increased; over the period 2001 to 2009, the total public education spending increased by more than 120 percent in real terms (World Bank 2013), while real public health spending increased by more than 130 percent from 2001 to 2008 (World Bank 2008).

However, the central government's spending accounts for less than half of public spending on health and education. With Indonesia's far-reaching decentralization reforms in 2001, district governments are responsible for a large share of public spending and service delivery and have a large degree of autonomy in determining the size and composition of their education and health budgets. In line with the national spending trends, these district governments have strongly increased their health and education spending since 2001. Few studies were conducted, however, to assess the effectiveness of this increased public spending.

This study attempts to assess the production efficiency of district public spending in health and education in Indonesia. We take a very broad approach, relating public spending to outputs and outcomes in the health and education sectors, without going into details into how the money is spent. The aim is to compare the efficiency in the public funds spending across districts.

At the national level, Indonesia seems to perform relatively well in terms of technical efficiency of public spending on health and education. Compared with other middle-income countries, Indonesia generally realizes more outputs and has better outcomes than one would expect given its level of public spending and GDP. This conclusion is based on plots where we examined the relation between public spending and health and education outputs and outcomes for middle income countries, based on the data from the World Development Indicators.[2] We averaged the data over 2005-2010 and highlighted the results for Indonesia in red squares in the figures included in the annex. Where there are multiple data, we also indicated the trend for Indonesia. For example, once we control for the level of GDP, Indonesia has relatively low pupil-teacher ratios and high enrolment rates and test scores, as compared to the average in middle-income countries with a similar level of public spending (Figure A1 in appendix). We also see a larger share of births attended by professional medical staff (Figure A2),

[2] Retrieved from http://data.worldbank.org/data-catalog/world-development-indicators

higher life expectancy and lower child mortality (Figure A3 and A4) than we would expect based on average income levels and spending. However, there are exceptions, especially for the higher end medical services, as Indonesia has less hospitals (Figure A5) and doctors (Figure A6) than one would expect given its level of development. Child malnutrition is also slightly higher than expected (Figure A7). These patterns are robust to corrections for Indonesia's level of GDP.

This report focuses on the spending at the district level by combining data from the Ministry of Finance on district spending, data from the Susenas household survey from 2001 to 2009, and health and education infrastructure indicators from the PODES village census. We then derive measures of district efficiency for each district. We also investigate whether the spending efficiency has improved or decreased over the period of investigation.

We find substantial variation in efficiency across regions in Indonesia. In terms of health, Sumatra is found to be efficient when it comes to spending given its level of health and education outputs and infrastructure, but has lower than expected utilization rates of health services. In terms of education, we find that the efficiency in education spending has decreased in Sumatra over the studies period, while in Sulawesi it has increased. Java and Bali always appear the most efficient in terms of the amount of public spending relative to the produced outputs, which could be partially due to the high population density.

The remainder of this paper is organised as follows: in section 2 we discuss the methods that we apply to assess the efficiency of district spending and compare these with existing literature on this topic, In section 3 we introduce the datasets and variables that we use in the subsequent analysis and present descriptive statistics, while in section 4 we present the estimation results underlying the efficiency measures. Section 5 concludes the paper.

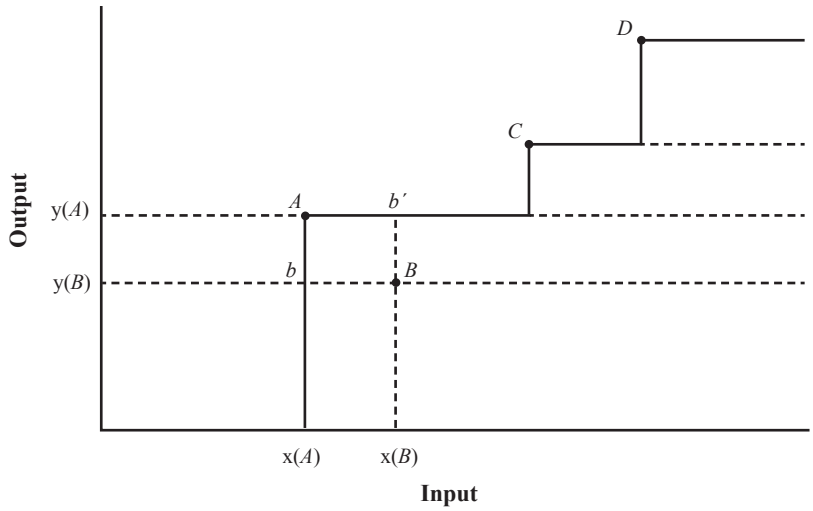
Measures of Productivity in Health and Education

In order to see whether the use of district public spending has been efficient and whether the existing budget has been spent wisely, one must look at whether the available resources are used in the most optimal way, providing the maximum possible number of outputs and outcomes. As outcomes we use enrolment rates for education and utilization rates for health. As outputs we consider the number of service providers in a village as the main variable; for education that is the number of schools and for health it is the number of clinics and the number of doctors. For evaluating efficiency of public spending, both are important. The relationship between outputs and spending gives an idea of unit prices of the spending. The relation between outcomes and spending indicate whether spending matters for development outcomes.

In general, there are two approaches which allow a systematic analysis of the efficiency of production. On the one hand, there is the so called Production Frontier analysis which labels a public service as efficient if it produces the maximum output possible given certain inputs. The unit of analysis is the administrative level at which the public services are delivered, such as the central government and ministries or, as we consider in this study, subnational administrations like district governments. If this efficiency target is not achieved, then public service delivery is considered to be inefficient. An alternative approach is the Production Function analysis, which analyses the average outputs that are obtained given a certain level of inputs. In order to give a better understanding of how efficiency will be estimated in the case of Indonesia, this section will thus first present the model underlying the production frontier analysis and highlight some applications to health and education, before setting out the empirical strategy.

To investigate the efficiency of production units, one can apply the Free Disposal Hull (FDH) analysis, which imposes less restrictions on the data than other methods. According to FDH analysis, a producer is relatively efficient if no other producer obtains the same amount or more of the output using less or the same amount of inputs. Inputs and/or outputs are by assumption freely disposable, giving a continuous Production Possibility Frontier (PPF) and relaxing the assumption of convexity as we know it from other PPFs. Production frontier analysis consists of two steps, by first establishing the PPF and, second, measuring relative inefficiencies. The concept of efficiency can be easily seen in Figure 1, where producer B is relatively inefficient compared to producer A, using more input to produce less output. Also producers C and D are relatively efficient, as there is no other producer using less input to generate more output. Points A, C and D therefore determine the production possibility frontier, represented by the thick line in an echelon form. Estimating the efficiency of districts, one can look at the distance of the individual results of each district to the PPF, representing the efficiency score. The lower this score, the more efficient district public spending is. In other words, it estimates how much the district wastes of its available public spending budget. In this graph, the input efficiency score can be calculated by X(A)/X(B), while the output efficiency score can be calculated by Y(B)/Y(A).

Figure 1: Free disposable hull (FDH) production possibility frontier (PPF)



Source: Gupta and Verhoeven (2001)

The literature on efficiency theory and especially production frontier analysis goes back a few decades, with a wide variety in empirical applications and units of analysis, such as firms and countries. Similar methods have also been applied in recent studies, analysing efficiency of public spending, which we will discuss briefly.

Gupta et al. (2001) compare the efficiency of government spending on health and education between 37 different African countries and in relation to Asian and western countries, based on a FDH analysis. This study considers several output indicators for education and health, for which it constructs a production frontier in various time periods. The FDH analysis enables a direct comparison among countries according to their levels of efficiency. The results suggest that countries in Africa are less efficient than countries in Asia and the Western Hemisphere.

Herrera and Pang (2005) also look at spending on education and health in developing countries, as these sectors receive the largest share of government expenditures. Their paper consists of two parts, first describing the use of the FDH analysis and calculating the distance from resulting input/output combinations to the production possibility frontier. In the second part, different levels of efficiency across countries are correlated to country characteristics using a tobit panel approach. The output indicators consist of nine educational indicators and four health output indicators, posing some interpretation challenges, since outputs and outcomes are not easy to distinguish, especially in the field of health. Countries with higher expenditure levels record lower efficiency. Other variables that impact positively the efficiency of spending are the share of private financing, urbanization, the lack of an aids epidemic, income inequality, and degree of domestic funding of health and education.

Afonso et al. (2003) in their study on 23 industrialized OECD countries compute indicators for public sector performance (PSP) and public sector efficiency (PSE), using public sector activities as outcomes for PSP. The resulting performance index is then used in a FDH analysis. Finally, Alfonso et al. (2003) calculate input and output efficiency scores with the help of a production possibility frontier in order to rank the corresponding countries according to their public spending efficiency. They find small differences in efficiency, with the most efficient countries being those with the smallest public sectors.

Jayasuriya and Wodon (2003) also apply a stochastic production frontier approach to estimate efficiency in the provision of health and education for 76 countries, choosing life expectancy and net enrolment in primary school as outcome indicators for health and education. They then relate the estimated technical efficiency to the bureaucracy, corruption, and urbanization, finding that quality of the bureaucracy, and urbanization are strong determinants of efficiency, but corruption less so.

The empirical approach for testing economic efficiency is based on a well-known regression model which estimates a production function that represents the maximum output attainable given a given set of inputs. The production frontier simply corresponds to a restriction within the empirical frame that no unit can exceed this maximum output. Measuring inefficiency then implies estimating empirically to what extent units, or districts in our case, fail to achieve the theoretical ideal of efficiency. Therefore the estimated model can be seen as a means to measuring actual inefficiency. Particularly, the parameter of interest representing inefficiency is the residual or error term, representing disturbances in a regression model. It is assumed that the error term has two components, the random error and a component measuring inefficiency. A standard production frontier model would estimate a regression incorporating the production function and the inputs on the right hand side as follows:

$$Output = f(spending, characteristics) + time\ trend + inefficiency\ variable + error\ term \quad (1)$$

The inefficiency variable explains relative underperformance in terms of the output; it enters in the production function with strictly negatively values. A measure of Technical Efficiency can then be constructed by taking the exponent of the predicted inefficiency variables, which ranges between zero (infinitely inefficient) and one (on the PPF with zero inefficiency).

While this approach seems theoretically appealing and relatively easy to apply, there are some caveats to consider. An important drawback of this approach is that important omitted variables might be misinterpreted as lack of technical efficiency. For example, investment in quality of public services or providing services to remote areas can be mistaken for relative inefficiencies if these investments are not adequately captured by observed variables in the production functions. We correct for this by including demographic and geographical characteristics of the districts.

A second problem is that it is difficult to construct one single variable on which to base efficiency. We would, for instance, like to compare education spending on outputs of the education sector while our data are disaggregated for primary and secondary education. In this study we therefore consider an alternative measure of efficiency that is simple to apply and easy to interpret for policy makers. Applying the theory of duality, we will be estimating a cost function, rather than a production function, where our model will look as follows:

$$District\ spending = f(outputs, characteristics) + time\ trend + fixed\ effect + random\ error\ term \quad (2)$$

The right hand side of the equation now includes the outputs and district characteristics, where all variables are in per capita units. In other words, rather than asking how efficient districts are in providing services given the public spending levels and physical inputs, we ask how much districts spend on health and education, given the quantity of services provided and the infrastructure. The composite residual of the fixed effect and the random error term can be directly interpreted as over- or under-spending by a district, relative to the national average. The advantage of this approach is that we can include output

variables related to different types of services on the right hand side. Some caveats remain, however, as this approach does not overcome the problem of omitted variables. We should therefore stress that this approach does not aim to interpret the estimated coefficients as causal relationships.

Data and Descriptive Analysis

Data

The analysis draws on three main data sources. First, we use annual public spending on health and education by district governments from 2001 to 2009, compiled by the Ministry of Finance.

Second, we use Indonesia's national household surveys, Susenas, from 2001 to 2009, which contain information on health care utilization, school enrolment, demographics and household expenditures, including annual spending on health and education. Regarding health care utilization, the Susenas survey records for each household member whether they have sought outpatient care in the last month, which health care providers they have visited and the number of visits per provider. The survey also collects information on inpatient care. However, for some years this data is unavailable, and we can therefore not use it in the regression analysis. Current school enrolment is recorded by education level, which we use to generate gross enrolment rates at district level. The annual national cross section surveys are representative at district level and can therefore be used to construct a district pseudo-panel and merged with the district spending data.

Finally, we use the PODES village census, which contains information on health care providers and schools, infrastructure, remoteness, and main sectors of economic activity in the villages. The village census can be merged with the Susenas and the data on public spending at the district level. For aggregating the village data at the district level we use the reported number of households in the village as a weight to calculate the average availability of public services and infrastructure in a village for each district.

During the period under study, new districts emerged as a result of district splits. In such cases, we aggregated the data from the split districts, and assigned those to the original district definition.[3] We applied the 2001 district definition frame. To control for the districts splits in the regression analysis, we generate a control variable that counts the number of splits per parent districts.

Unfortunately, some of the districts had to be dropped from the sample for several reasons. First, the capital Jakarta comprises 6 districts but is treated as one observation, since its budget data is consolidated. Second, the two provinces of Aceh and Papua are excluded from the study since they are not included in all Susenas survey rounds due to local conflicts that made it unsafe for surveyors to collect information. In addition, both provinces have been granted a special autonomy status in 2001 and are there for not a suitable comparison for the other districts in this analysis.

Descriptive statistics for outcome and output variables in the unbalanced panel of 299 districts are presented in Table 1.

[3] Districts splits followed almost entirely sub-district boundaries within the relevant district, and did not affect borders with neighbouring districts. See Fitrani, Hofman and Kaiser (2005) for a more complete account of this process. Statistics Indonesia maintains a full list of district codes over time (see http://www.bps.go.id/mstkab/mfkab_03_09.pdf).

The health and education outcome variables that we consider in the analysis are gross school enrolment and outpatient health care utilization. Ideally, we would have uses actual health outcomes and test scores, but this information is not available at district level. The output variables relate to staffing and infrastructure, such as the presence of at least one public health care provider in the village (hospitals, puskesmas and *puskesmas pembantu*), the number of doctors in the village and the number of schools in the village (primary, junior secondary and senior secondary schools). Data on the number of teachers per district are not available.

Table 1: Main output and outcome variables in district pseudo panel 2001-2009

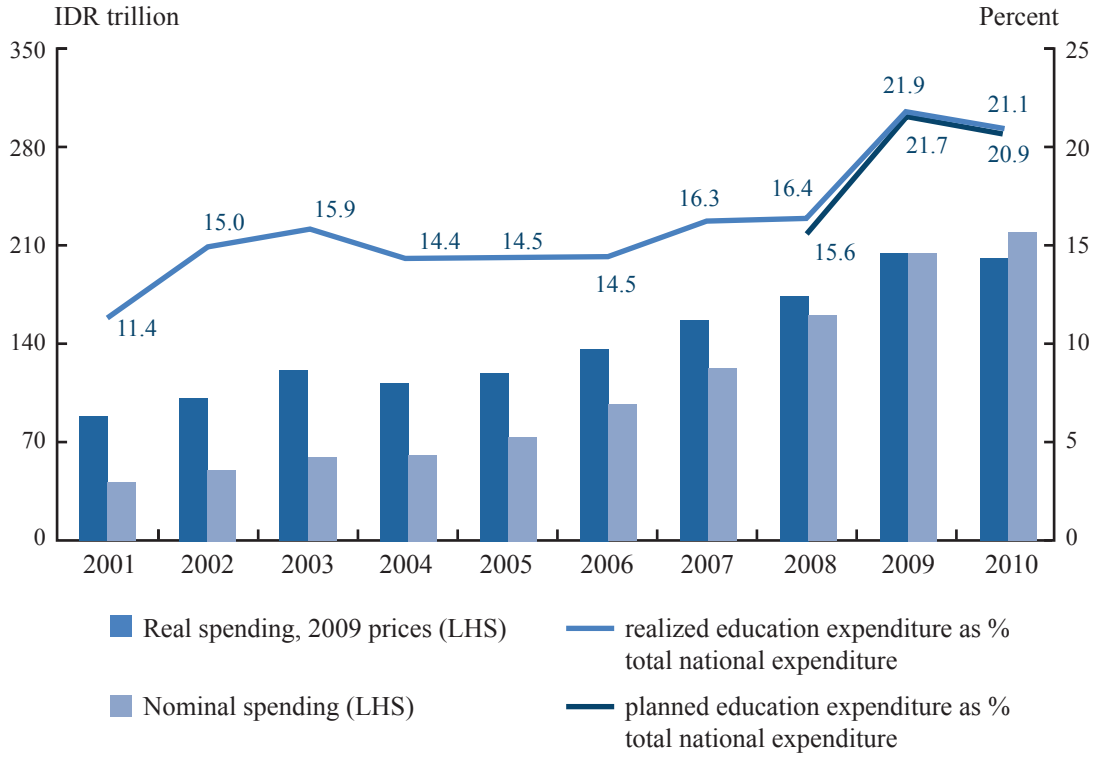
Variable	N	Mean	St.dev.	Min	Max
Outcomes					
Average nr of outpatient visits (public)	2,739	0.092	0.057	0.006	0.505
Gross primary enrolment rate	2,739	0.935	0.042	0.760	1.079
Gross junior secondary enrolment rate	2,739	0.811	0.138	0.235	1.243
Gross senior secondary enrolment rate	2,739	0.565	0.192	0.093	1.206
Per capita household health spending	2,739	71,892	44,954	4,715	352,865
Per capita household education spending	2,739	152,384	222,163	7,923	1,975,454
Outputs					
Average nr of SD in village	821	4.034	2.275	0.999	16.318
Average nr of SMP in village	821	0.967	0.657	0.217	4.846
Average nr of SMU in village	821	0.487	0.437	0.066	3.424
Probability of hospital in village	821	0.067	0.078	0.000	0.448
Probability of puskesmas in village	821	0.231	0.142	0.067	0.950
Probability of *pusk. pembantu* in village	821	0.437	0.190	0.000	0.984
Average nr of doctors in village	821	1.729	2.599	0.113	22.234
Village infrastructure and remotness					
Piped/pump water in village	821	0.328	0.285	0.000	1.000
Majority of traffic by water	821	0.018	0.054	0.000	0.469
Majority of traffic by asphalt road	821	0.732	0.218	0.133	1.000
Agriculture main economic activity	821	0.704	0.321	0.000	1.000
Population density (population/ha)	821	27.352	39.415	0.450	260.443

Source: Authors' calculations based on the Susenas household surveys and the PODES village census. Note that PODES variables are only available for 2003, 2006 and 2008.

Trends in public spending on education and health

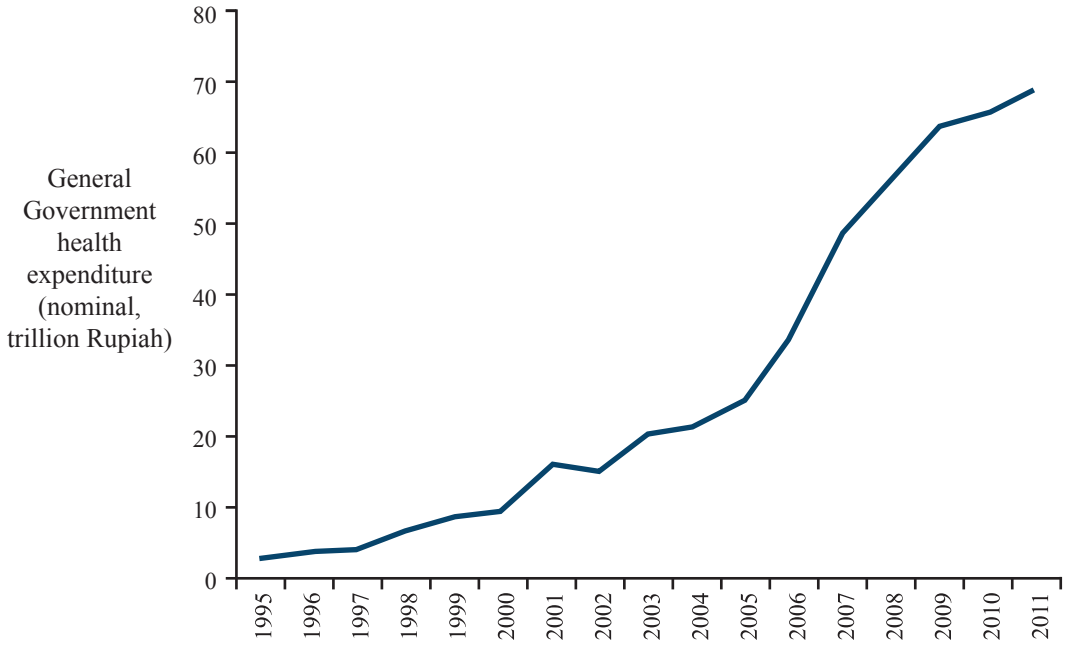
The decade since decentralization has seen a substantial increase in public spending on health and education in real terms (see Figure 2 and 3). A large part of this increase can probably be traced to the start of the decentralization period, where many of the functions were delegated to the districts but central ministries remained in control of substantial budgets. From 2006 to 2009, education spending also increased substantially, probably as a result of the law stipulating that 20 percent of the budget should be spent on education. Spending on health also increased strongly in the same period. This strong increase in public health spending can partly be attributed to the expansion of social health insurance to the informal sector under the Askeskin, and later Jamkesmas programmes. This also led to an increase of the central government share of total public health spending, from around 32 to 40 percent.

Figure 2: Trends in Public Education expenditure



Source: Cerdan-Infantes et al. (2013).

Figure 3: Government health expenditure



Source: Global Health Expenditure Database, WHO (http://apps.who.int/nha/database/DataExplorerRegime.aspx).

District spending

Tables 2 and 3 present the authors' calculations of district education and health spending over the period from 2001 to 2009. Table 2 shows an increase in the per capita district education spending during the first for years of decentralization, and then a slight decrease in 2005 and 2006. From 2007, public education spending shows a similar strong increase as observed for total spending. Public health spending by districts increased strongly over this period as well, with a gradual increase throughout 2001 to 2006, followed by a strong increase from 2007 to 2009, where spending more than doubled on real per capita basis compared to 2006 (Table 3).

Table 2: Real per capita public district education spending (Ind. Rp., corrected for regional price differences and inflation)

Year	Indonesia	Java/Bali	Sumatra	Sulawesi	Kalimantan	Other
2001	159,387	133,433	167,697	190,833	181,973	179,316
2002	170,313	137,234	183,242	200,352	220,476	171,317
2003	188,512	146,486	203,753	230,127	250,958	203,928
2004	197,963	151,576	235,046	242,487	222,498	223,252
2005	186,922	141,175	220,890	245,958	211,608	190,386
2006	187,251	153,945	199,967	220,327	230,763	200,326
2007	283,207	188,403	415,623	331,073	384,111	226,903
2008	336,005	241,407	451,126	342,312	431,692	330,946
2009	381,214	288,096	471,303	417,199	454,888	362,474

Source: Authors' calculations based on data on annual public spending on health and education by district governments, compiled by the Ministry of Finance.

Table 3: Real per capita public district health spending (Ind. Rp., corrected for regional price differences and inflation)

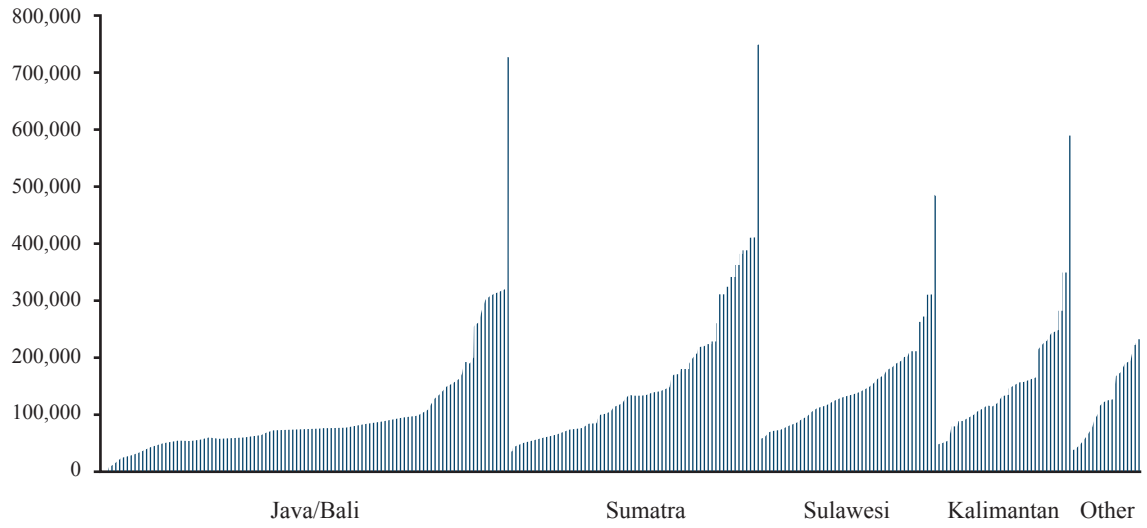
Year	Indonesia	Java/Bali	Sumatra	Sulawesi	Kalimantan	Other
2001	29,772	25,484	27,598	33,389	42,949	33,921
2002	33,122	27,935	33,569	35,852	46,647	33,818
2003	43,154	35,677	44,845	50,125	56,679	46,559
2004	45,817	35,583	52,453	54,886	56,275	49,729
2005	46,776	35,173	55,199	61,002	56,685	44,048
2006	55,081	44,015	54,138	67,285	78,395	59,867
2007	88,549	57,996	117,189	111,386	136,113	74,420
2008	116,562	75,794	143,537	124,433	199,821	108,640
2009	128,643	94,527	156,486	145,378	157,896	126,956

Source: Authors' calculations based on data on annual public spending on health and education by district governments, compiled by the Ministry of Finance.

We find substantial regional variation in per capita public health and education spending. Java/Bali have the lowest per capita spending and experience the most gradual increase, while Kalimantan and Sulawesi have the highest spending on average and the strongest increase after 2006.

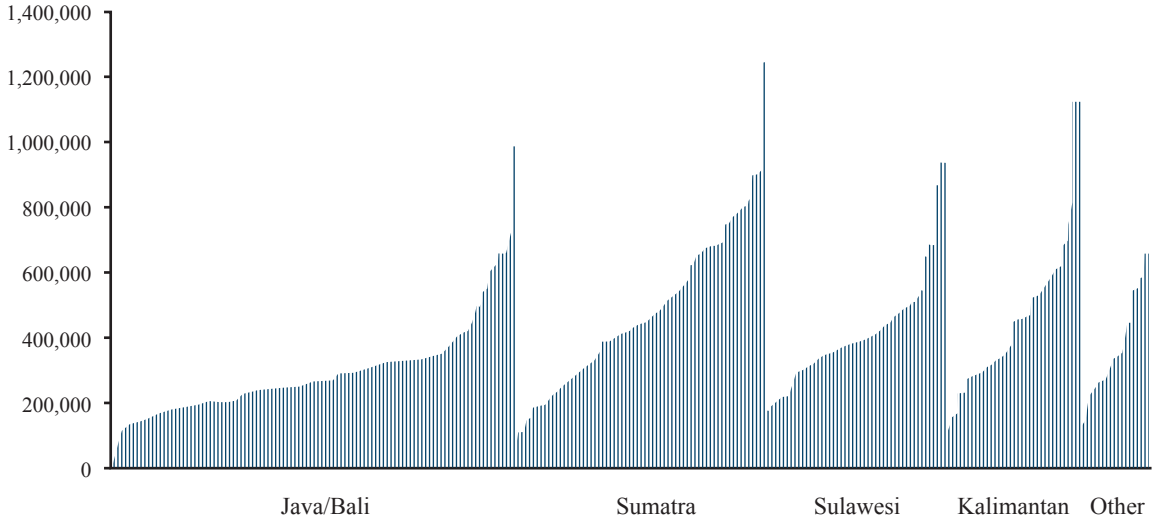
Similarly, large variations are found when we compare districts directly, as shown in Figure 4 and Figure 5, which rank districts by their per capita spending 2009. Spending by district in Java/Bali is low on average, but also shows relatively less variation between districts. Sumatra and Kalimantan show the largest variation between districts.

Figure 4: Per capita district health spending in 2009, by region



Source: Authors' calculations based on data on annual public spending on health and education by district governments, compiled by the Ministry of Finance.

Figure 5: Per capita district education spending in 2009, by region

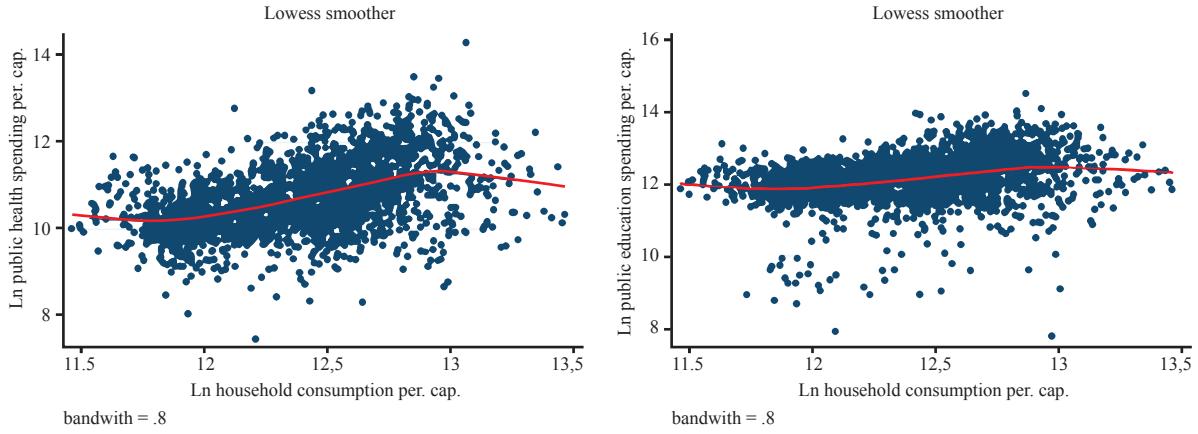


Source: Authors' calculations based on data on annual public spending on health and education by district governments, compiled by the Ministry of Finance.

Patterns in public spending by districts

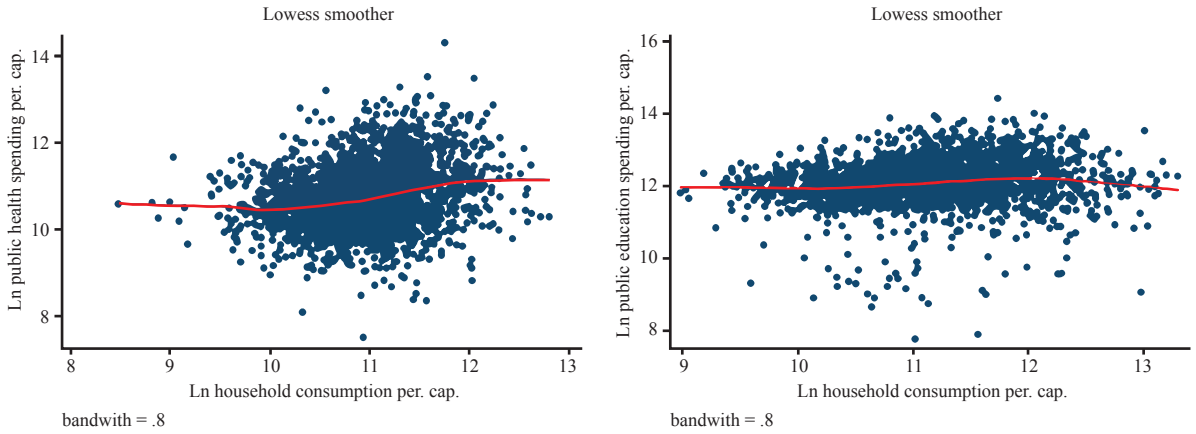
Local governments spend relatively more on public health and education in districts with relatively wealthy populations. We find that per capita public spending is positively correlated with per capita household expenditure in districts, as shown in Figure 6, although this relationship is less pronounced for education expenditure (the right hand side figure) than for health (the left hand side figure). The graphs pool data for all years and depict per capita expenditure on the horizontal axis and public spending on the vertical axis, all in real terms. By taking logs for both variables, the slope of the trend line can be interpreted as elasticity; that is, the extent to which a percentage change in household consumption is correlated with a percentage change in public spending. We observe similar patterns when we look at the correlation between per capita public spending and per capita private spending on education and health in Figure 7.

Figure 6: Correlation between per capita public spending on health and education and level of wealth



Source: Authors' calculations based on data on annual public spending on health and education by district governments, compiled by the Ministry of Finance.

Figure 7: Correlation between per capita public spending and private spending on health and education



Source: Authors' calculations based on data on annual public spending on health and education by district governments, compiled by the Ministry of Finance.

This positive correlation between public and private spending raises the question whether there are common spending patterns over time across districts. In particular, are differences in public spending between districts determined by local endowments or driven by policy priorities? If it is endowments, we would expect persistent disparities that are reflected by the ranking of districts by spending to be stable over time: that is, wealthy districts will always spend more. On the other hand, if spending is mainly determined by local policy priorities, and if policy priorities are subject to change and local political developments, then we would expect that rankings are more likely to change over time.

To identify patterns in public spending, and assess whether district spending tends to converge or whether there are persistent disparities between districts, we first present Spearman rank correlations of per capita health and education spending in Tables 4 and Table 5. The correlation coefficients reflect the stability in ranking of districts between two particular years. The results suggest that the current position of a district's level of public spending compared to that of other districts is largely determined by its relative position in the past, but that there is also considerable room for movement. The rank correlations for health are generally higher for health spending than for education. For health, we do see some changes in the ranking, in particular after 2004, while the ranking in education spending is mostly unstable during the first 4 years of decentralization. In other words, endowments do seem to play a role. However, there is also evidence that there is scope for local policy in setting spending priorities, which may lead to convergence in public spending.

Table 4: Rank correlation of per capita health spending between all years

Year	2001	2002	2003	2004	2005	2006	2007	2008	2009
2001	1.00								
2002	0.83	1.00							
2003	0.80	0.88	1.00						
2004	0.79	0.85	0.89	1.00					
2005	0.74	0.73	0.78	0.87	1.00				
2006	0.77	0.74	0.78	0.80	0.79	1.00			
2007	0.75	0.75	0.79	0.79	0.79	0.79	1.00		
2008	0.65	0.67	0.70	0.68	0.69	0.70	0.79	1.00	
2009	0.70	0.77	0.82	0.74	0.71	0.71	0.79	0.81	1.00

Source: Authors' calculations based on data on annual public spending on health and education by district governments, compiled by the Ministry of Finance.

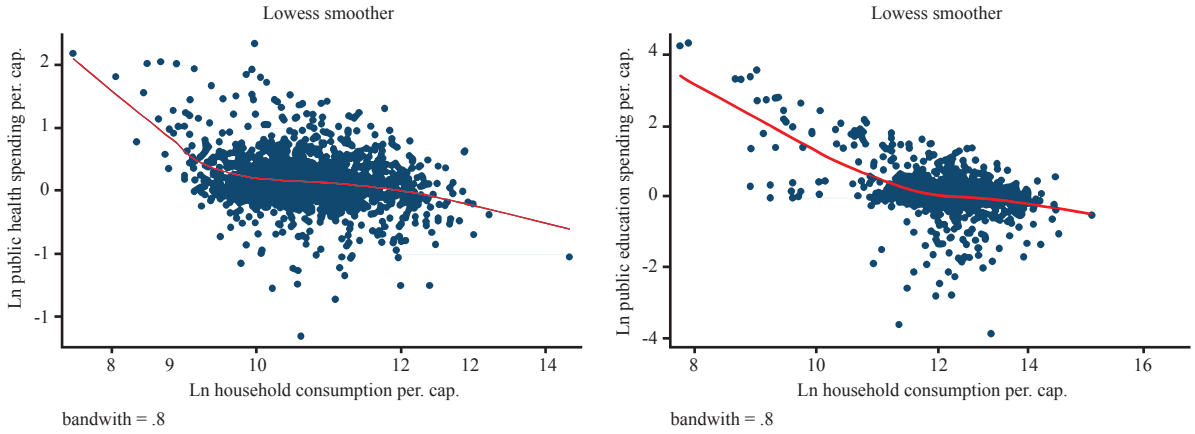
Table 5: Rank correlation of per capita education spending between all years

Year	2001	2002	2003	2004	2005	2006	2007	2008	2009
2001	1.00								
2002	0.69	1.00							
2003	0.62	0.70	1.00						
2004	0.67	0.71	0.71	1.00					
2005	0.67	0.67	0.60	0.83	1.00				
2006	0.69	0.60	0.69	0.72	0.73	1.00			
2007	0.66	0.64	0.67	0.74	0.70	0.74	1.00		
2008	0.65	0.69	0.66	0.63	0.69	0.72	0.68	1.00	
2009	0.62	0.70	0.70	0.68	0.68	0.66	0.71	0.78	1.00

Source: Authors' calculations based on data on annual public spending on health and education by district governments, compiled by the Ministry of Finance.

Figure 8 provides further evidence that there is some degree of convergence. The graphs depict on the horizontal axis the natural logarithm (ln) of per capita spending on health (the graph on the right) and education (the graph on the left) lagged by one year, and on the vertical axis the annual change in ln per capita spending. The trend lines for both graphs are downward sloping but gradually flatten out, suggesting that districts with relatively low per capita spending in a given year typically show a larger increase (or smaller decrease) in spending the following year, compared to districts with relatively high levels of public spending. In other words, low spending districts seem to catch up with high spending districts. We observe this for both health and education spending.

Figure 8: Convergence in health and education spending



Source: Authors' calculations based on data on annual public spending on health and education by district governments, compiled by the Ministry of Finance.

Trends for our output and outcome variables by region and year

9 until Figure 19 provide descriptive statistics for our outcome and output variables. Data are presented for 2003, 2006 and 2008, the years for which the PODES data are available and we have thus access to both output and outcome data.

For education, we see small changes in primary and junior secondary enrolment. This is particularly striking for junior secondary enrolment, which is still around 80 percent. Senior secondary enrolment showed a steady increase over the studied period, mostly as a result of gains in Java/Bali and the 'other islands' regions.

Looking at outputs, we find a clear deviation from the trend in 2008. The number of schools increased considerably in Java/Bali, Sumatra and Kalimantan. For senior secondary, the same pattern is found, for all regions.

Across all islands, we observe steady increase is outpatient utilization rates for public care. The rates almost doubled at the national level, indicating a substantial increase in access to public health care provision.

As with education, we observe some strong increases in the availability of health care from 2006 to 2008. The number of hospitals increased in Java/Bali, Sumatra and Kalimantan; the number of puskesmas increased a lot in Sumatra and Kalimantan, while there was no change in the provision of auxiliary health centres. For doctors, we see an increase across all regions in 2008. The average number of doctors per village increase by over a half in this period.

Production Efficiency Analysis

First, we analyse spending as a function of all outputs. This analysis looks at how much districts spend on health and education, given the service delivery, infrastructure and staff. The estimated coefficients could be interpreted as average prices, while the predicted error term indicates whether the district on average spends more or less than one would expect given the available outputs. Those who spend more could be considered inefficient. In running these regressions, we take account of the demographic and geographical patterns observed in the district. These control variables include average age, gender composition, household size, and village characteristics regarding the availability of piped/pump water, whether the majority of village traffic is by water or on asphalt roads, whether agriculture is the main economic activity, as well as the population density.

Second, we analyse outcomes as a function of spending, as well as the available outputs and district characteristics. The coefficients provide an indication to what extent additional spending and outputs translate into development outcomes. We apply frontier estimation techniques, thus estimating the maximum reachable output, given a level of spending, outputs and characteristics. The inefficiency error term indicates how far below the efficiency frontier a districts is, that is, how much less outcomes are achieved relatively to what is possible given the district spending, outputs and characteristics.

District spending on health and education

The results for the spending regressions, following equation (2), are presented in Table 6. We show both fixed effects and random effects estimates. While we use the district fixed effects estimates for predicting spending efficiency, we report the random effects estimates to assess the correlation (not the causal relationship) between the dependent and independent variables.

We find a strong positive correlation between health care utilization and public spending, which persists when we control for district fixed effects. A similar result is found for the availability of subsidiary health centres, but not for village health centres. This would suggest that availability of village health centres is proportional to population size (after controlling for remoteness indicators), and therefore does not show much variation on per capita basis. Variation across districts in services provided by public health centres is likely to be found in the quality of care rather than the physical presence of health centres. There is a positive correlation between spending and the number of hospitals, most of which is explained by fixed effects. This would reflect the relatively long-term nature of investment in public hospitals, providing too little variation for the fixed effects within-estimator to identify any effects on public spending.

Education spending is positively correlated with enrolment in junior and secondary schooling, but not primary school enrolment. This is most likely due to near universal primary enrolment, in which case per capita amounts would be near constant. An alternative explanation could be the centrally provided BOS programme, which was a key source of primary school funding. There is also a strong negative association between per capita spending and the number of primary and junior secondary schools in the villages, which most likely captures economies of scale for district administrations. For senior secondary schools these economies of scale are not observed. However, any correlation of education spending with enrolment and availability of schools is eliminated by the fixed effects.

For both the public health and education spending regressions we find few effects of remoteness and infrastructure characteristics that maintain statistical significance when we control for district-fixed effects. The share of district populations that live in villages where the majority of traffic uses asphalt roads is positively correlated with public spending in the random effects regressions only, which is most likely driven by unobserved confounding factors, such as endowments and the level of economic development, that determine general levels of public spending and investments in infrastructure. Remoteness seems to be captured mainly by the population density variable, which shows that more densely populated districts face lower per capita spending; remoteness thus increases the costs of provide public education and health services.

Finally, districts splits unequivocally increase per capita public spending, which can be potentially explained by two effects. First, districts splits are expected to decrease economies of scale and increase fixed costs associated with public service delivery and operating district administrations. A second explanation for increased public spending could be the per capita increase in district revenues induced by creating new district administrations, in particular from transfers from the central government.

Table 6: Per capita public health and education spending regressions, district fixed effects

	Health	Health	Education	Education
	FE	RE	FE	RE
Ln(average nr visits public outpatient)	0.0671*	0.1154**		
	[0.0321]	[0.0285]		
Ln(nr puskesmas/village)	-0.0499	0.0223		
	[0.0886]	[0.0660]		
Ln(nr hospitals/village)	0.0084	0.0173+		
	[0.0106]	[0.0094]		
Ln(nr *puskesmas pembantu*/village)	0.0170**	0.0232**		
	[0.0040]	[0.0049]		
Ln(nr doctors/village)	0.0658	0.0626		
	[0.0487]	[0.0420]		
Ln(Gross enrolment primary)			-0.0663	0.2675
			[0.3110]	[0.2940]
Ln(Gross enrolment junior sec.)			0.0088	0.1344+
			[0.0934]	[0.0810]
Ln(Gross enrolment senior sec.)			-0.0519	0.1612**
			[0.0561]	[0.0478]
Ln(nr SD/village)			-0.0983	-0.1950*
			[0.1270]	[0.0773]
Ln(nr SMP/village)			0.0775	-0.1547+

Table 6: Per capita public health and education spending regressions, district fixed effects (continued)

	Health	Health	Education	Education
			[0.1000]	[0.0899]
Ln(nr SMU/village)			-0.0460	0.1443*
			[0.0601]	[0.0561]
Ln(average age)	-0.5688	-0.7164+	-0.2159	-0.2150
	[0.6065]	[0.4057]	[0.5859]	[0.3256]
Ln(female population share)	0.5598	0.8232	0.3297	0.6209
	[0.6186]	[0.6170]	[0.5323]	[0.4890]
Ln(average household size)	-1.0031*	-0.0241	-0.3934	0.4221+
	[0.4179]	[0.3072]	[0.3272]	[0.2399]
Ln(piped/pump water)	-0.0013	-0.0010	0.0017	-0.0015
	[0.0050]	[0.0054]	[0.0026]	[0.0034]
Ln(majority traffic by water)	-0.0005	0.0012	0.0010	0.0018
	[0.0019]	[0.0019]	[0.0022]	[0.0018]
Ln(majority traffic by asphalt road)	0.0275	0.2062**	0.0502	0.2934**
	[0.0896]	[0.0664]	[0.0788]	[0.0548]
Ln(agriculture main sector)	0.0087*	0.0044	0.0021	-0.0055
	[0.0042]	[0.0058]	[0.0023]	[0.0038]
Ln(population density)	-0.0185	-0.0765**	0.0024	-0.0813**
	[0.0498]	[0.0282]	[0.0461]	[0.0222]
District split	0.2033**	0.1913**	0.1004**	0.0786*
	[0.0306]	[0.0267]	[0.0372]	[0.0321]
Year = 2003	-0.9058**	-0.8866**	-0.5255**	-0.4670**
	[0.0407]	[0.0330]	[0.0402]	[0.0349]
Year = 2006	-0.5273**	-0.5081**	-0.3909**	-0.3680**
	[0.0240]	[0.0220]	[0.0249]	[0.0221]
Constant	15.1559**	14.8358**	14.1018**	13.7920**
	[2.5227]	[1.8361]	[2.3311]	[1.3838]
Observations	764	764	764	764

*Note: Standard errors in brackets. Statistical significance: + 10%; * 5%; ** 1%.*

The composite residual (the fixed effect and predicted error) of the fixed regressions reflects the relative under- or over spending, given the inputs and outputs produced in the district. The distribution of this relative spending performance is given in Table 7. As mentioned earlier, one caveat that we need to bear in mind when interpreting the residual is that we do not take into account the quality of care or additional investments in service delivery to remote areas. These unobserved policy variables would be

confounding the time variant component of the residual. In addition, some static regional features, such as the relatively high costs of delivering care to remote areas, would be picked up by the fixed effect. While quality is difficult to control for with the available data, we do include various village variables that capture remoteness. Moreover, our results do not seem to be sensitive to including remoteness variables.

Table 7 presents estimates of district efficiency in spending, averaged out over regions by year. A lower number indicates lower than expected spending, thus greater efficiency. Efficiency is measured relative to the national average. For instance, an estimate of -0.25 indicates that a region spent 25 percent less on average, given its level of service delivery. We see that Java and Bali are generally efficient while Sulawesi and Kalimantan are less so, although for Sulawesi we do see an improvement over time. For Sumatra we see an initial efficiency level equal to the national trend, but over time relative efficiency has decreased strongly.

Table 7: Relative spending efficiency by region (predicted fixed effect + time variant error term)

	Health spending			Education spending		
	2003	**2006**	**2008**	**2003**	**2006**	**2008**
Java/Bali	-0.234	-0.295	-0.341	-0.234	-0.252	-0.300
Sumatra	0.080	0.076	0.267	0.151	0.183	0.324
Sulawesi	0.243	0.306	0.243	0.189	0.183	0.128
Kalimantan	0.271	0.372	0.392	0.244	0.238	0.270
Other islands	0.189	0.106	0.050	0.133	0.026	-0.013

How efficient are districts in providing services?

The production function estimates have service delivery as the dependent variable and public spending and outputs as explanatory variables. Given a level of spending and infrastructure, are there then more or fewer services delivered than expected? To recap, the frontier models use a specific error term structure that consists of an error that is normally distributed (the usual error term) and an error term that is always negative (to measure inefficiency). This inefficiency term is bounded by zero at the production possibility frontier. As districts are increasingly inefficient and move away from the PPF, the inefficiency error term falls further below zero. The estimated measure of Technical Efficiency is simply the exponent of the predicted inefficiency term, and is therefore bounded by one (for districts on the PPF) and zero (infinitely inefficient).

The production frontier analysis regression results are presented in Table 8, which shows that per capita public spending is associated with increased health care utilization and gross secondary enrolment. However, we do not find a statistically significant effect for primary enrolment. Again, this could be explained by near universal primary enrolment as well as the School Operational Assistance (*Bantuan Operasional Sekolah* or BOS) programme.

The supply of public health care providers, in particular village health centres, has increased outpatient utilization. The availability primary schooling has a negative association with all levels of enrolment, while the number of senior secondary schools shows a positive association.

Table 8: Frontier regressions

	Public outpatient utilization	Ln gross primary enrolment	Ln gross junior secondary enrolment	Ln gross senior secondary enrolment
Ln(district health spending pc), lagged	0.1394**			
	[0.0320]			
Ln(district educ. spending pc), lagged		0.0009	0.0375**	0.0682**
		[0.0023]	[0.0075]	[0.0134]
Ln(nr hospitals/village)	-0.0115			
	[0.0121]			
Ln(nr puskesmas/village)	0.1199*			
	[0.0555]			
Ln(nr *puskesmas pembantu*/village)	0.0303+			
	[0.0177]			
Ln(nr doctors/village)	-0.1323**			
	[0.0372]			
Ln(nr SD/village)		-0.0191**	-0.1400**	-0.3302**
		[0.0066]	[0.0258]	[0.0438]
Ln(nr SMP/village)		0.0102	0.0107	-0.0656
		[0.0088]	[0.0328]	[0.0584]
Ln(nr SMU/village)		0.0065	0.1377**	0.3988**
		[0.0058]	[0.0202]	[0.0368]
Ln(average age)	0.1260	0.0550*	0.8063**	1.8131**
	[0.3165]	[0.0268]	[0.0963]	[0.1702]
Ln(female population share)	0.9464	-0.0278	-0.5486**	-1.1809**
	[0.7076]	[0.0559]	[0.2064]	[0.3671]
Ln(average household size)	1.0019**	0.0034	0.0096	0.8390**
	[0.2590]	[0.0205]	[0.0756]	[0.1356]
Ln(piped/pump water)	0.0032	0.0005	-0.0003	-0.0012
	[0.0056]	[0.0004]	[0.0016]	[0.0028]
Ln(majority traffic by water)	-0.0055*	0.0004*	-0.0003	-0.0042**
	[0.0023]	[0.0002]	[0.0007]	[0.0012]

Table 8: Frontier regressions (continued)

	Public outpatient utilization	Ln gross primary enrolment	Ln gross junior secondary enrolment	Ln gross senior secondary enrolment
Ln(majority traffic by asphalt road)	0.0606	0.0007	0.0243	0.2466**
	[0.0708]	[0.0054]	[0.0191]	[0.0349]
Ln(agriculture main sector)	-0.0152**	0.0005	0.0020	0.0004
	[0.0057]	[0.0004]	[0.0016]	[0.0029]
Ln(population density)	0.0267	-0.0047**	0.0293**	0.0074
	[0.0244]	[0.0018]	[0.0062]	[0.0113]
District split	0.0174	-0.0031	-0.0061	0.0349+
	[0.0361]	[0.0028]	[0.0099]	[0.0181]
Year = 2003	-0.2947**	-0.0338**	0.0876**	0.0660**
	[0.0552]	[0.0040]	[0.0140]	[0.0254]
Year = 2006	-0.0280	-0.0103**	0.0499**	0.0908**
	[0.0496]	[0.0039]	[0.0136]	[0.0244]
Constant	-4.9138**	-0.1854	-3.4064**	-8.7061**
	[1.5891]	[0.1301]	[0.4613]	[0.8370]
Observations	695	695	695	695

*Note: All models include year dummy variables. Standard errors in brackets. Statistical significance: + 10%; * 5%; ** 1%.*
Source:

The technical efficiency estimates, averaged by region and year, are presented in Table 9. For outpatient care, the districts in Java/Bali seem, on average, to be the most efficient and this position is stable over time. Districts in Sumatra and Sulawesi show an increase in technical efficiency, while in Kalimantan technical efficiency declines slightly. By 2009, Sulawesi has reached the level of technical efficiency of Java/Bali, while Sumatra has lagged behind.

We find very little differences for gross enrolment in primary school, as all districts are very close to the PPF. This is most likely explained by the high levels of primary enrolment and the large share of central funding through the BOS programme, leaving little room for efficiency gains at the district level. For secondary education, however, the differences are more pronounced, with similar patterns for gross enrolment into junior and senior secondary school. Districts in Sumatra and Java/Bali are the most efficient. But whereas technical efficiency in Java/Bali has improved over time, we see a gradual decline in Sumatra. Technical efficiency has also increased for the districts in Nusa Tenggara Barat (NTB), Nusa Tenggara Timur (NTT) and Sulawesi.

Table 9: Technical efficiency by region

	Outpatient care utilization			Gross enrolment Primary			Gross enrolment Junior secondary			Gross enrolment Senior secondary		
	2003	2006	2008	2003	2006	2008	2003	2006	2008	2003	2006	2008
Java/Bali	0.770	0.751	0.756	0.974	0.973	0.970	0.855	0.864	0.860	0.786	0.795	0.804
Sumatra	0.699	0.736	0.727	0.975	0.975	0.976	0.895	0.894	0.876	0.836	0.835	0.822
Sulawesi	0.728	0.756	0.753	0.962	0.969	0.970	0.819	0.843	0.843	0.760	0.809	0.788
Kalimantan	0.744	0.756	0.732	0.974	0.978	0.980	0.867	0.884	0.855	0.768	0.807	0.778
Other islands	0.855	0.844	0.841	0.969	0.977	0.968	0.760	0.851	0.826	0.720	0.795	0.791
National	0.750	0.756	0.755	0.972	0.974	0.972	0.854	0.870	0.857	0.788	0.808	0.801

Conclusion and Recommendations

We analysed the relationship between district public spending, outputs and outcomes in the education and health sector over the period from 2003 to 2008. We found that, especially in the second half of this period, there have been substantial increases in health and education service availability. This has gone hand in hand with strong increases in public spending.

There is a large disparity in spending between districts in terms of per capita public spending, both within and between regions. To a large extent this is driven by relatively static characteristics of districts. However, there is some evidence of convergence in spending levels as well as scope for local policy changes to overcome initial public spending differences. This suggests that the central government transfers remain an important policy tool for equalizing investment in health and education in districts.

We found substantial changes in relative efficiency of public spending across regions. Given the level of service delivery, public spending per capita is on average relatively low in Java and Bali. In contrast, Sulawesi and Kalimantan are relatively less efficient in terms of spending, while in Sumatra spending efficiency by district governments has declined strongly since 2006. Districts in Java and Bali also perform well, on average, in terms of technical efficiency. Service delivery in these districts is relatively high, given the level of spending and available infrastructure.

There are some limitations and caveats to this study that need to be emphasized. First, the estimation results do not reflect causal relationships, but show differences in average spending, service delivery and efficiency. Second, due to data limitations the analysis is very much quantity- focused and does not include information on the quality of public services. Investments in quality of care could be therefore mistaken as inefficient spending. This highlights that for future analyses of the effectiveness and efficiency of public spending, more district level information on the quality of education and health care is needed.

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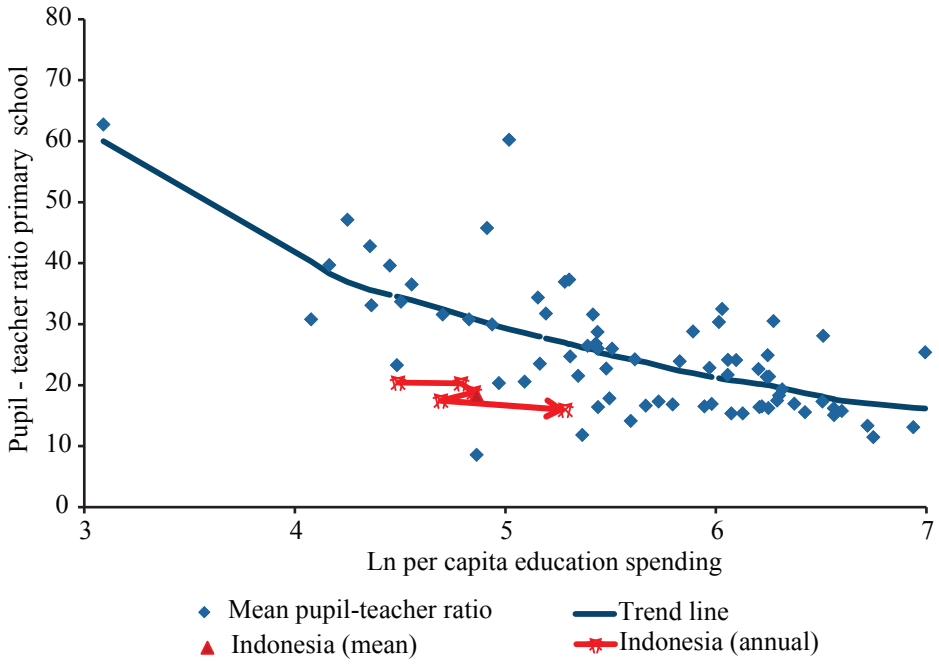
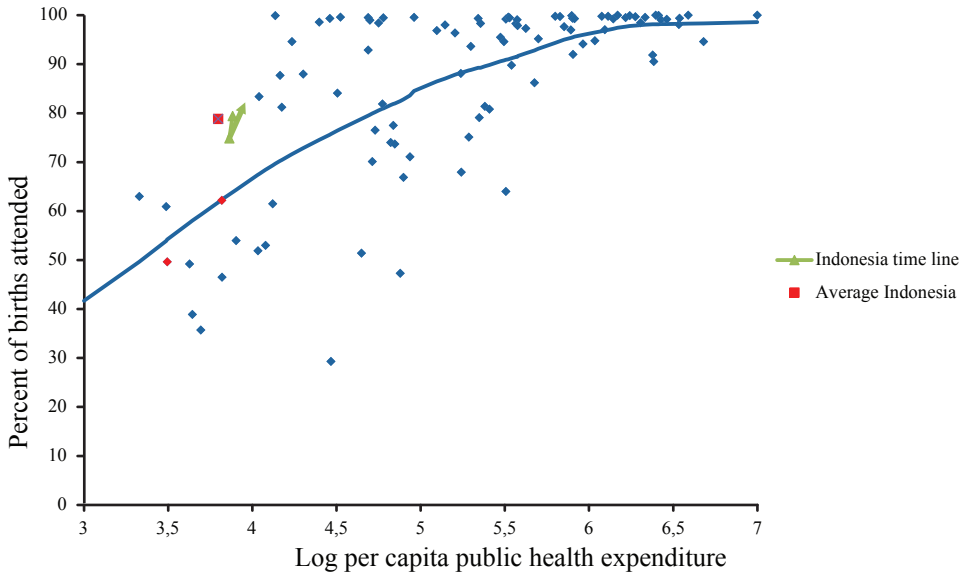
Annex:
Indonesian Health and Education Outcomes in an International Context

Figure A1: Pupil Student rations and Per capita public education spending



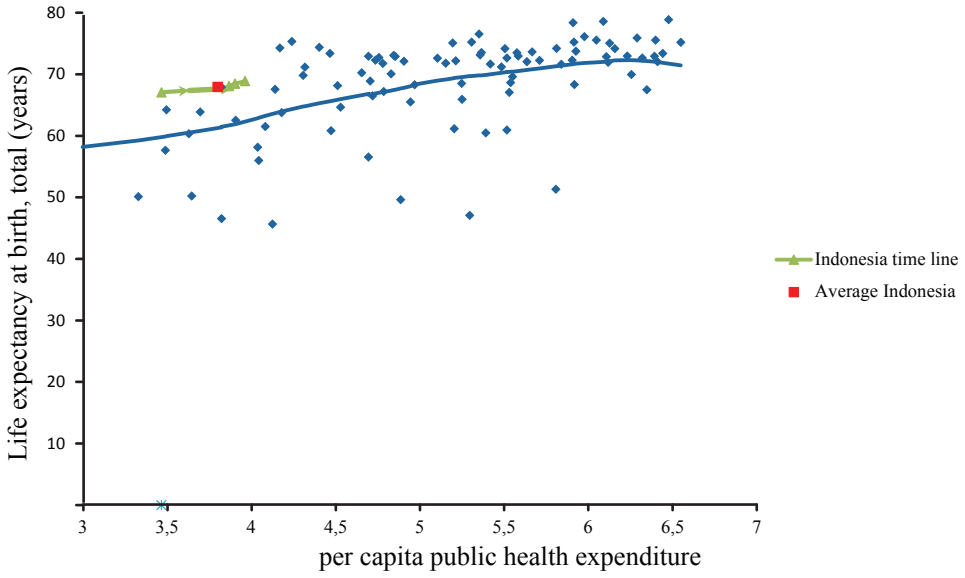
Source: World Bank Development Indicators.

Figure A2: Births attended by medical staff and public health care expenditure



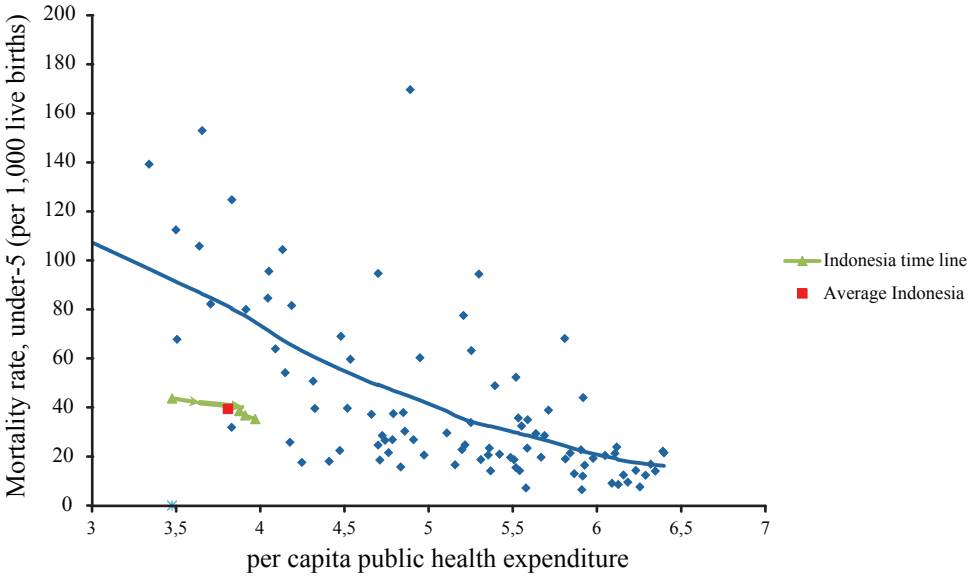
Source: World Bank Development Indicators.

Figure A3: Life expectancy and public health expenditure



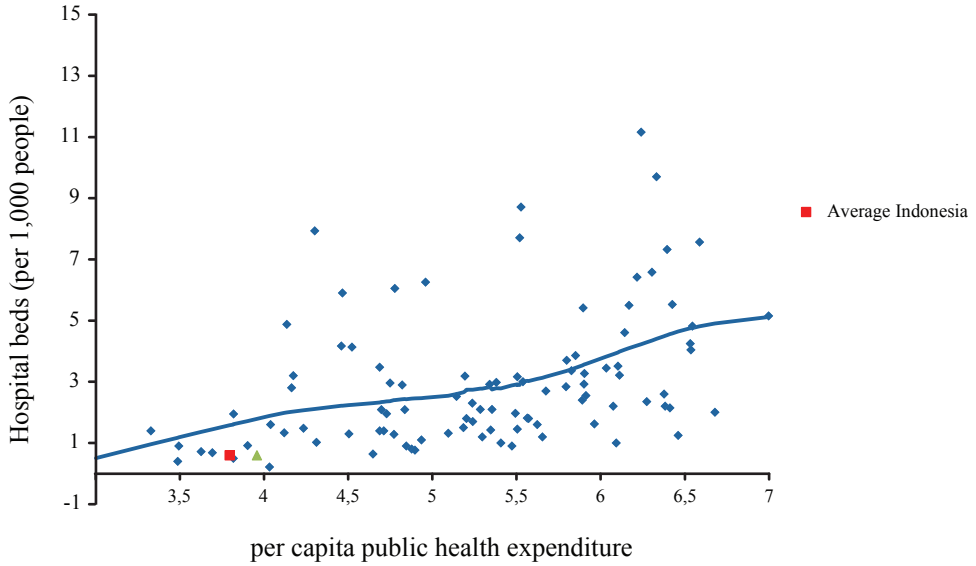
Source: World Bank Development Indicators.

Figure A4: Child mortality and public health expenditure



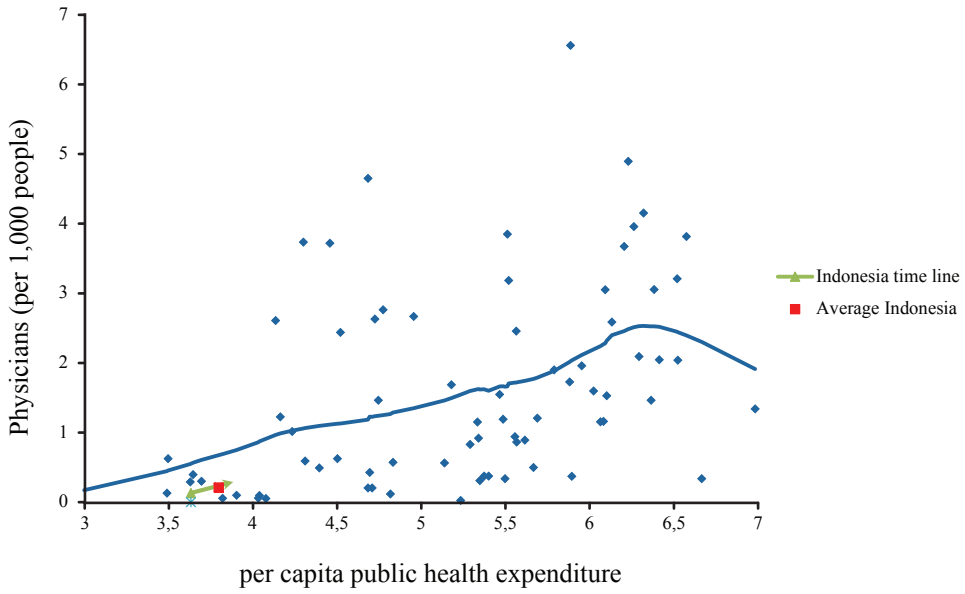
Source: World Bank Development Indicators.

Figure A5: Hospital beds and public health expenditure



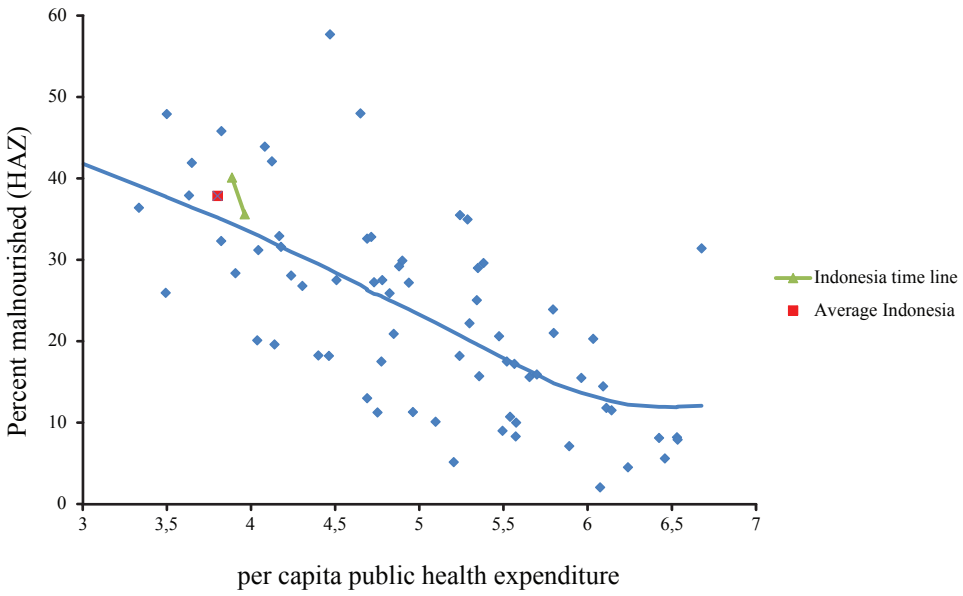
Source: World Bank Development Indicators.

Figure A6: Physicians and public health expenditure



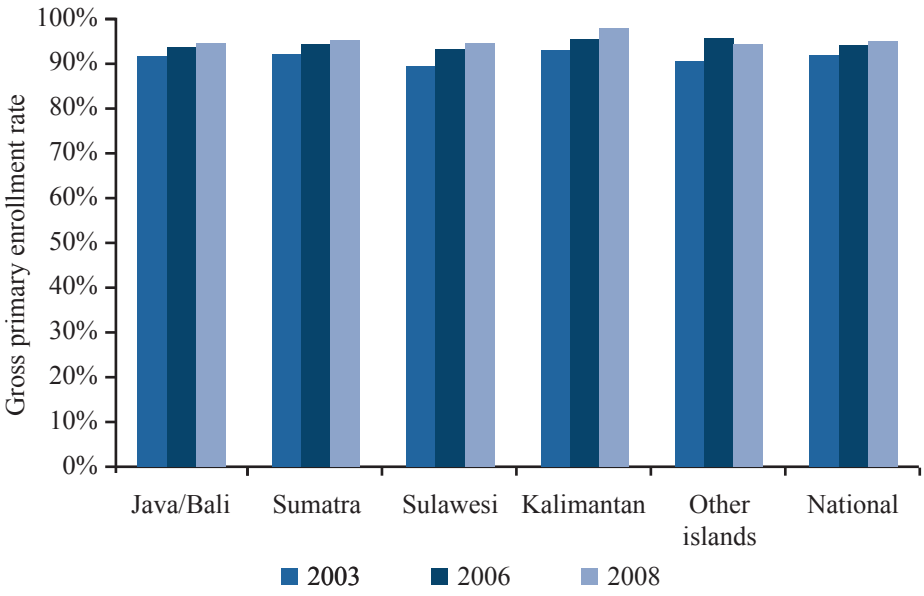
Source: World Bank Development Indicators.

Figure A7: Malnutrition as measured by Height for age Z scores (percentage below 0.05) and public health expenditure



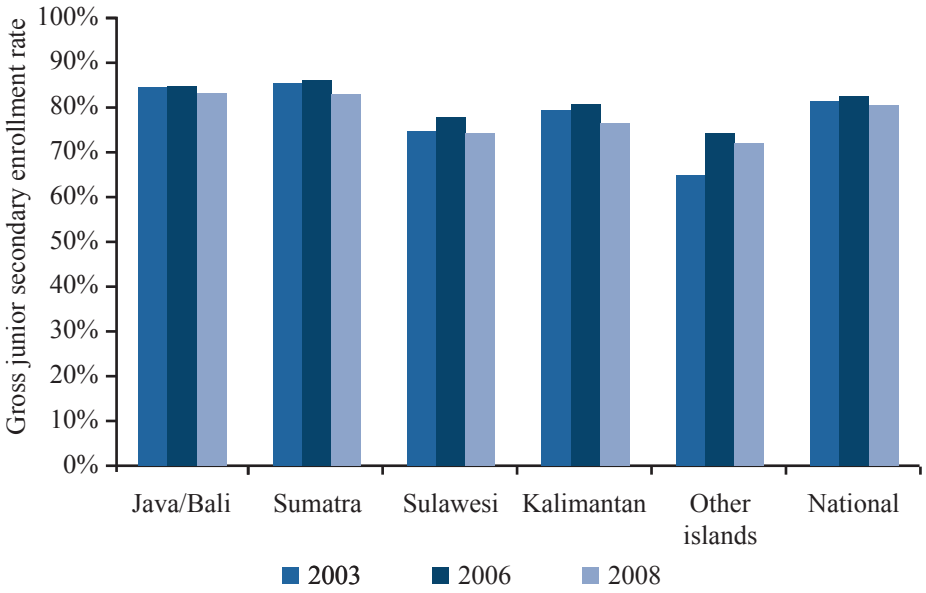
Source: World Bank Development Indicators.

Figure A8: Education outcome: Gross primary enrolment



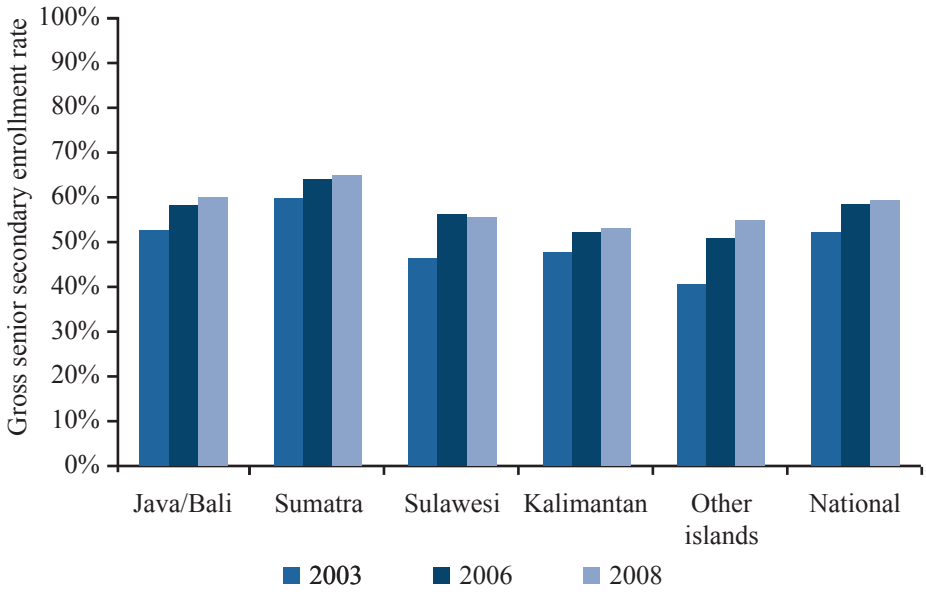
Source: Authors' calculations based on data on the Susenas household surveys.

Figure A9: Education outcome: Gross junior secondary enrolment



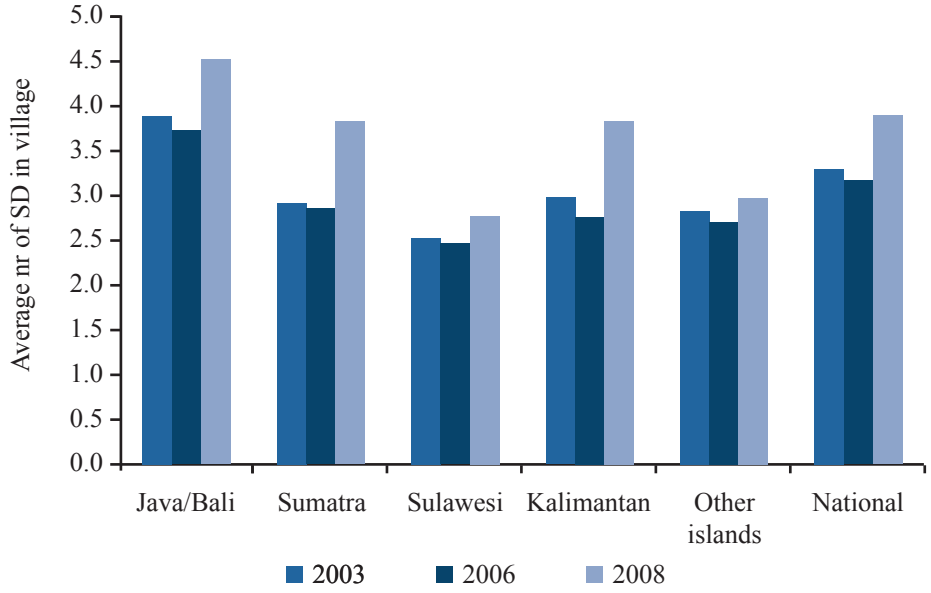
Source: Authors' calculations based on data on the Susenas household surveys.

Figure A10: Education outcome: Gross senior secondary enrolment



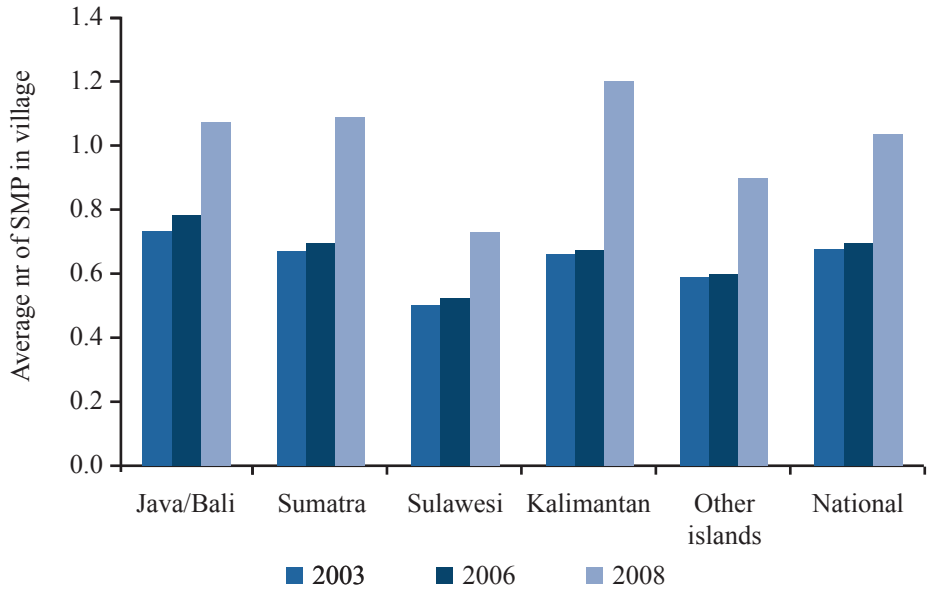
Source: Authors' calculations based on data on the Susenas household surveys.

Figure A11: Education output: Average number of primary schools in village



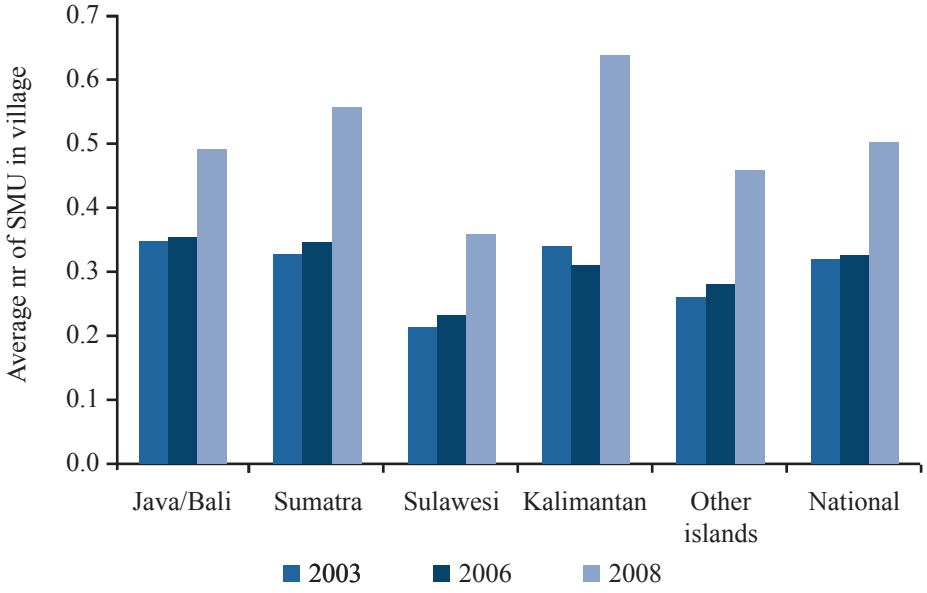
Source: Authors' calculations based on data on the PODES village census.

Figure A12: Education output: Average number of junior secondary schools in village



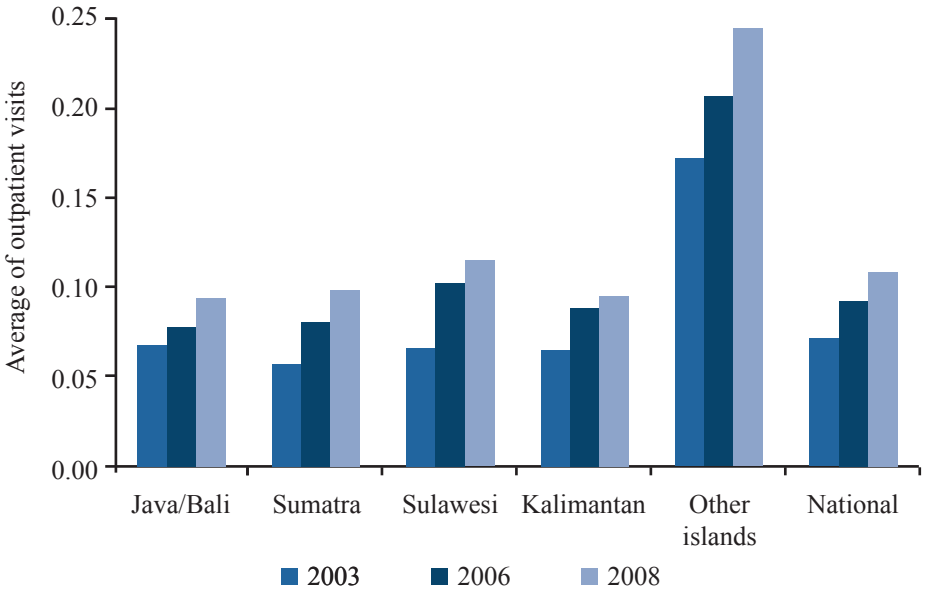
Source: Authors' calculations based on data on the PODES village census.

Figure A13: Education output: Average number of senior secondary schools in village



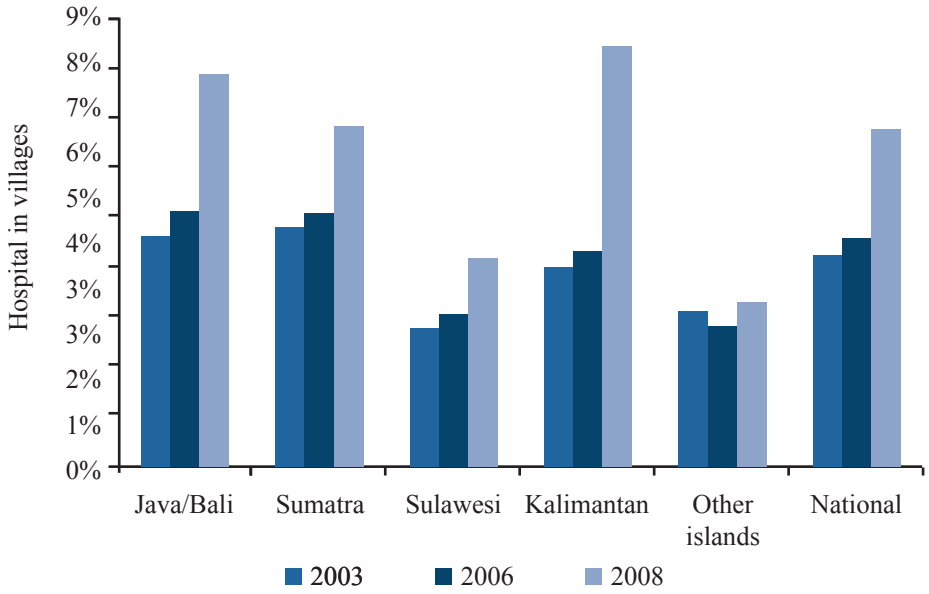
Source: Authors' calculations based on data on the PODES village census.

Figure A14: Health outcome: Utilization of public outpatient care



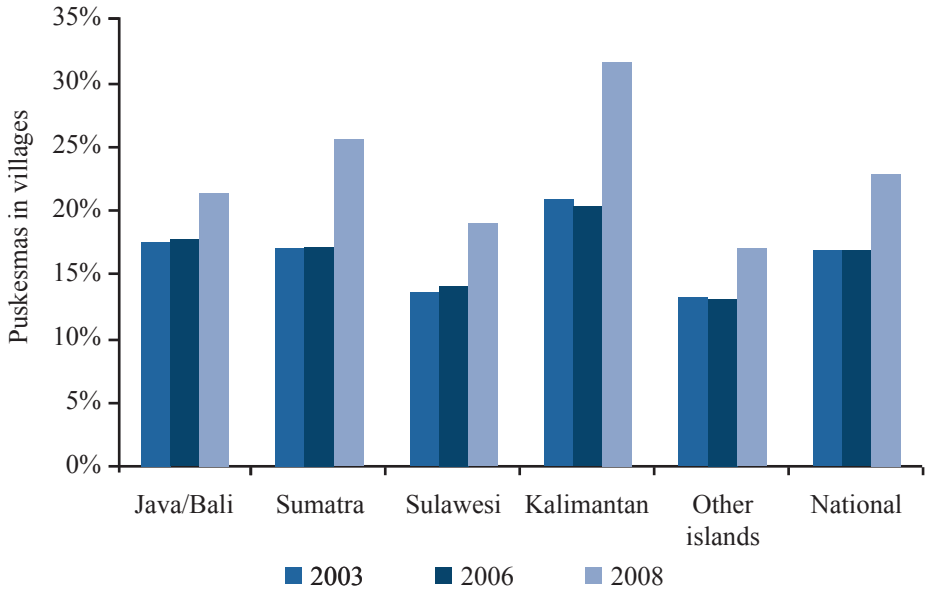
Source: Authors' calculations based on data on the Susenas household surveys.

Figure A15: Health output: probability of hospital in village



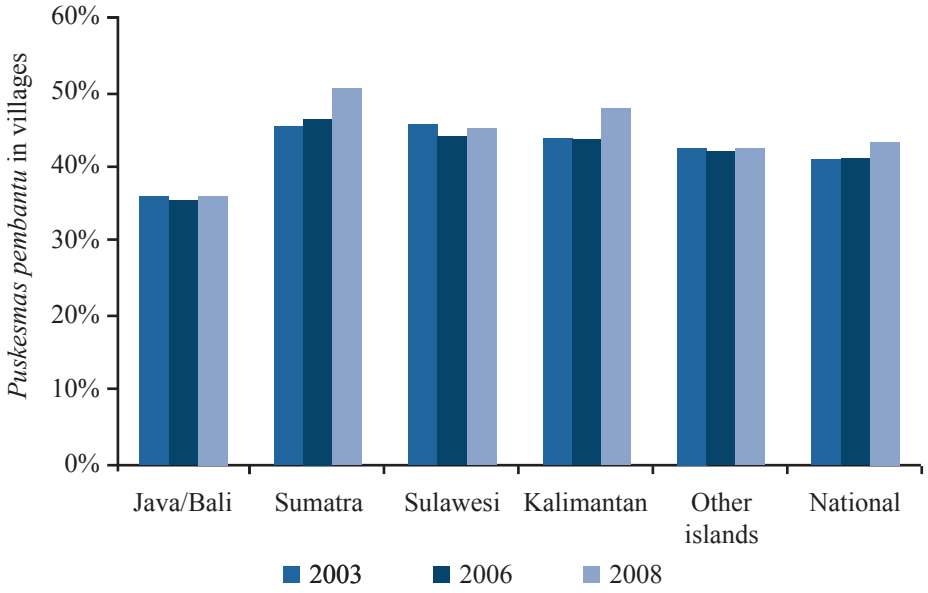
Source: Authors' calculations based on data on the PODES village census.

Figure A16: Health output: probability of puskesmas in village



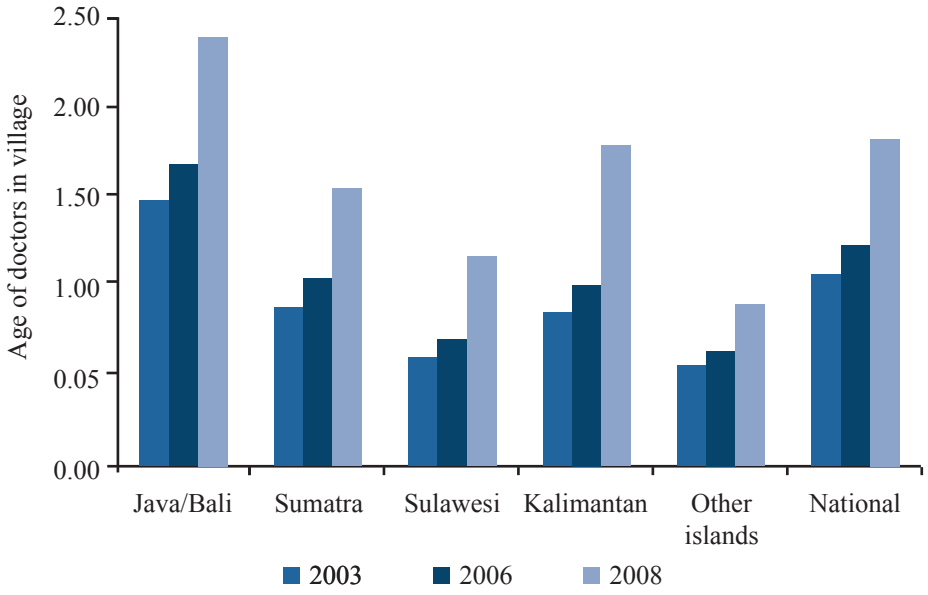
Source: Authors' calculations based on data on the PODES village census.

Figure A17: Health output: probability of *puskesmas pembantu* in village



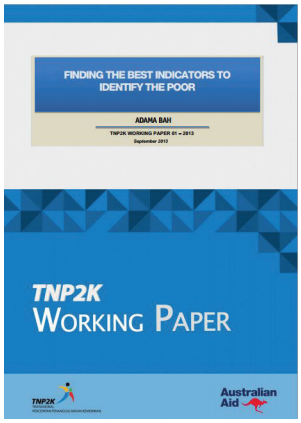
Source: Authors' calculations based on data on the PODES village census.

Figure A18: Health output: average number of doctors in village



Source: Authors' calculations based on data on the PODES village census.

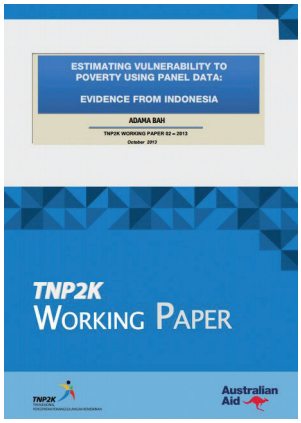
TNP2K Working Paper Series



Working Paper 1
Finding the Best Indicators to Identify the Poor

Author : Adama Bah

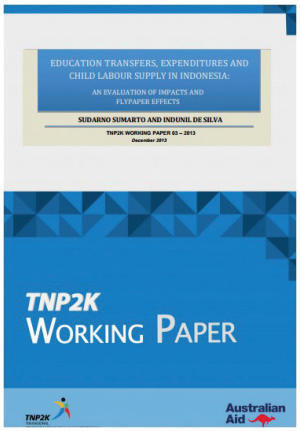
Proxy-means testing (PMT) is a method used to assess household or individual welfare level based on a set of observable indicators. The accuracy, and therefore usefulness of PMT relies on the selection of indicators that produce accurate predictions of household welfare. In this paper the author proposes a method to identify indicators that are robustly and strongly correlated with household welfare, measured by per capita consumption. From an initial set of 340 candidate variables drawn from the Indonesian Family Life Survey, the author identifies the variables that contribute most significantly to model predictive performance and that are therefore desirable to be included in a PMT formula. These variables span the categories of household private asset holdings, access to basic domestic energy, education level, sanitation and housing. A comparison of the predictive performance of PMT formulas including 10, 20 and 30 of the best predictors of welfare shows that leads to recommending formulas with 20 predictors. Such parsimonious models have similar predictive performance as the PMT formulas currently used in Indonesia, although these latter are based on models of 32 variables on average.



Working Paper 2
Estimating Vulnerability to Poverty using Panel Data: Evidence from Indonesia

Author : Adama Bah

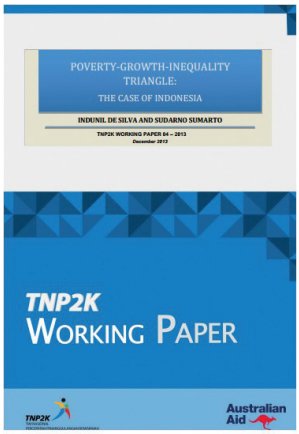
Traditional poverty measures fail to indicate the degree of risk of becoming or remaining poor that households are confronted to. They can therefore be misleading in the context of implementing poverty reduction policies. In this paper the author proposes a method to estimate an index of ex ante vulnerability to poverty, defined as the probability of being poor in the (near) future given current observable characteristics, using panel data. This method relies on the estimation of the expected mean and variance of future consumption conditional on current consumption and observable characteristics. It generates a vulnerability index, or predicted probability of future poverty, which performs well in predicting future poverty, including out of sample. About 80% of households with a 2000 vulnerability index of 100% are actually poor in 2007. This approach provides information on the population groups that have a high probability of becoming or remaining poor in the future, whether currently poor or not. It is therefore useful to complement traditional poverty measures such as the poverty headcount, in particular for the design and planning of poverty reduction policies.



Working Paper 3
Education Transfer, Expenditures And Child Labour Supply in Indonesia: An Evaluation of Impacts And Flypaper Effects

Author : Sudarno Sumarto and Indunil De Silva

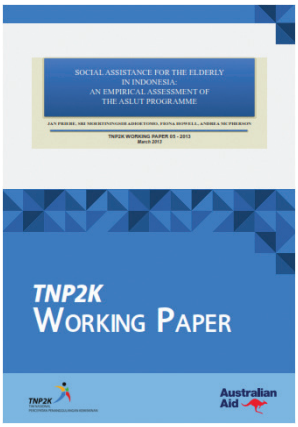
In this paper the authors investigate how the receipt of educational transfers, scholarships and related assistance programmes affects the labour supply of children and the marginal spending behaviour of households on children's educational goods. The authors use a nationally representative household survey of unusual scope and richness from Indonesia. They found strong evidence of educational cash transfers and related assistance programmes significantly decreasing the time spent by children on income-generating activities in Indonesia. Households receiving educational transfers, scholarships and assistance were also found to spend more at the margin on voluntary educational goods. These results were stronger on children living in poor families. The findings of this study lend support to the growing view in the literature that educational transfers, scholarships and related assistance can actually have a positive impact on economic development by increasing the level of investment in human capital. The results are particularly relevant for understanding the role of cash transfers and education assistance in middle-income countries, where enrolment rates are already at satisfactory levels, but the challenge is to keep post-primary students in school. Finally, the principal message that emerges from the study is: there are quantitatively non-negligible, average gains from educational transfers and support programmes on household education spending and child labour, especially for the poor.



Working Paper 4
Poverty-Growth-Inequality Triangle: The Case of Indonesia

Author : Sudarno Sumarto and Indunil De Silva

This paper decomposes changes in poverty into growth and redistribution components, and employs several pro-poor growth concepts and indices to explore the growth, poverty and inequality nexus in Indonesia over the period 2002-2012. The authors find a 'trickle-down' situation, which the poor have received proportionately less benefits from growth than the non-poor. All pro-poor measures suggest that economic growth in Indonesia was particularly beneficial for those located at the top of the distribution. Regression-based decompositions suggest that variation in expenditure by education characteristics that persist after controlling for other factors to account for around two-fifths of total household expenditure inequality in Indonesia. If poverty reduction is one of the principal objectives of the Indonesian government, it is essential that policies designed to spur growth also take into account the possible impact of growth on inequality. These findings indicate the importance of a set of super pro-poor policies. Namely, policies that increase school enrolment and achievement, effective family planning programmes to reduce the birth rate and dependency load within poor households, facilitating urban-rural migration and labour mobility, connect leading and lagging regions and granting priorities for specific cohorts (such as children, elderly, illiterate, informal workers and agricultural households) in targeted interventions will serve to simultaneously stem rising inequality and accelerate the pace of economic growth and poverty reduction.



Working Paper 5
*Social Assistance for the Elderly in Indonesia: an Empirical Assessment of the ASLUT Programme**

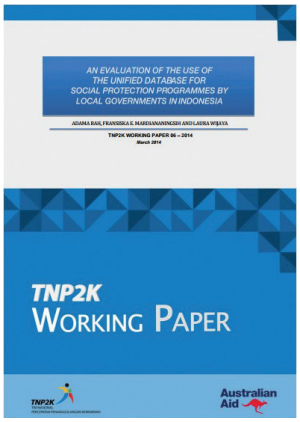
Asistensi Sosial Untuk Usia Lanjut di Indonesia: Kajian Empiris Program ASLUT

Author : Sri Moertiningsih Adioetomo, Fiona Howell, Andrea McPherson, Jan Priebe

Indonesia has undergone a demographic transition since the 1970s that has led to significant changes in the population age structure of the country. Life expectancy at birth increased from 45 years to 67 years. The number of elderly people aged 60 and above rose from about 5 million in 1970 to 18 million in 2010, and is projected to increase to over 71 million in 2050. The economic situation for many elderly persons is precarious. In 2011, 12 percent of older people were below the official poverty line. Older people, especially those in their 70s and those aged 80 and above, have the highest poverty rates among the population groups, 13.3 percent and 16 percent respectively. At the same time, a much greater proportion of the elderly population than officially classified as poor is vulnerable to falling into poverty. Moreover, many of the elderly suffer from poor health and have low literacy levels.

Currently, the coverage of the elderly with the existing formal pension schemes is very low. The Government of Indonesia (GOI) recognizes the gaps in the social insurance schemes and is explicitly taking actions to improve pension coverage. ASLUT, the current social assistance programme targeted directly at poor and neglected elderly, started in 2006 in six provinces reaching 2,500 beneficiaries. It has recently expanded to all 33 provinces and increased the number of recipients to 13,250 in 2011, and 26,500 beneficiaries in 2012. This paper explores the strengths and weaknesses of the coverage provided to the elderly and recommends that the ASLUT programme be developed further to meet the demographic challenges that Indonesia faces.

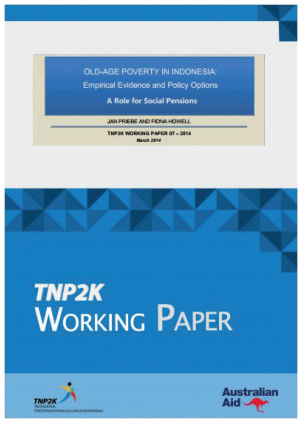
*This Working Paper has been republished in 2014



Working Paper 6
An Evaluation Of The Use Of The Unified Database For Social Protection Programmes By Local Governments In Indonesia

Author : Adama Bah, Fransiska E. Mardiananingsih and Laura Wijaya

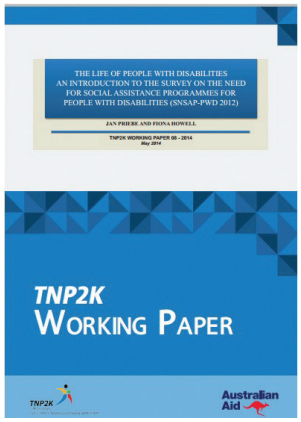
The Unified Database for Social Protection Programmes (UDB) contains detailed socioeconomic and demographic information, as well as the names and addresses of the poorest 40 percent of the Indonesian population. Since 2012, the National Team for the Acceleration of Poverty Reduction (TNP2K), which manages the UDB, has provided this data to over 500 local government institutions to facilitate the implementation of local poverty reduction programmes. This paper evaluates the use of the UDB data based on the results of a qualitative assessment of data utilisation at the local level and a self-administered user feedback survey. To improve the cooperation with local governments for increased effectiveness of poverty reduction programmes, the authors' main recommendations are for TNP2K to engage more proactively with the institutions that request data, through (i) regular follow-ups with these institutions, (ii) a broad dissemination of socialisation material explaining the UDB, and (iii) the provision of specialised training on the use of UDB data for the planning and implementation of local programmes.



Working Paper 7
Old-Age Poverty in Indonesia: Empirical Evidence and Policy Options - A Role for Social Pensions

Author : Jan Priebe and Fiona Howell

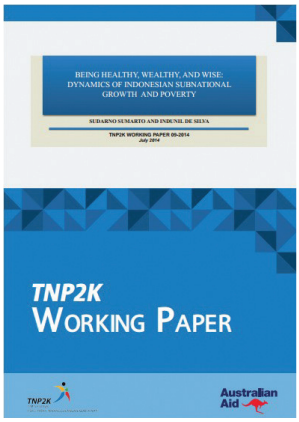
Indonesia in 2013 is an ageing society with an elderly population (60+) of approximately 18 million or eight percent of the total population. Due to continuously low fertility levels, lower mortality and higher life expectancy rates, the number of elderly in the country is predicted to increase to more than 80 million individuals by 2050 who will by then constitute about 25 percent of the total population. Considering the rise in its elderly population and the low pension coverage, the Indonesian government has shown strong commitment towards raising the number of elderly who have access to formal pensions. In line with a variety of social welfare laws, the National Security Law (SJSN), declarations under ASEAN and commitments to a comprehensive social protection floor policy, Indonesia has endorsed a mutli-pillar approach to providing income support in old age. However, the current reforms associated with the SJSN Law; aim only at providing income support to the future elderly generation - those working age adults that will retire in 15-40 years. While the success of these reforms needs to be demonstrated, there remains substantial scope to address the need for pension coverage among the current elderly population. Old-Age Poverty in Indonesia: Empirical Evidence and Policy Options – A Role for Social Pensions aims at filling several evidence gaps in the discussion on elderly and old-age poverty in Indonesia. Firstly it provides a detailed and comprehensive picture of the socio-economic circumstances of the current elderly generation. By doing so it provides Indonesia's first nationally representative poverty assessment on the elderly addressing aspects of education, health and remittances as well as poverty measurement. Second, the report outlines Indonesia's legal, political and programme commitments to alleviate old-age poverty and contrasts it with recent international experience on pension reform. This report discusses in particular the benefits of social pensions for Indonesia's elderly, and outlines the pros-and cons of poverty-targeted and universal pension schemes. Finally, the report provides ex-ante simulation results on the poverty and fiscal impacts for selected social pension schemes.



Working Paper 8
The Life of People with Disabilities: An Introduction to the Survey on the Need for Social Assistance Programmes for People with Disabilities

Author : Jan Priebe and Fiona Howell

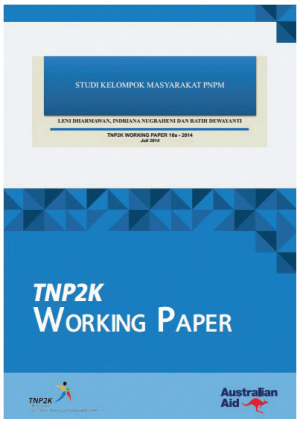
In 2012, the Demographic Institute of the University of Indonesia conducted on behalf of TNP2K a unique survey on disability that sheds new light on the needs and living conditions of people with disabilities (PWDs) in Indonesia. This new dataset is called the Survey on the Need for Social Assistance Programmes for People with Disabilities (SNSAP-PWD 2012) and is available free of charge from TNP2K and PRSF. This paper provides an introduction into the SNSAP-PWD 2012 by describing its sampling design and the topics covered.



Working Paper 9
Being Healthy, Wealthy, and Wise: Dynamics of Indonesian Subnational Growth and Poverty

Author : Sudarno Sumarto and Indunil De Silva

The aim of this study is twofold. First, despite the vast empirical literature on testing the neoclassical model of economic growth using cross-country data, very few studies exist at the subnational level. The authors attempted to fill this gap by using panel data for 2002–12, a modified neoclassical growth equation, and a dynamic-panel estimator to investigate the effect of both health and education capital on economic growth and poverty at the district level in Indonesia. Second, although most existing cross-country studies tend to concentrate only on education as a measure of human capital, the authors expanded the analysis and probed the effects of health capital as well. To their knowledge, no study has done a direct and comprehensive examination of the impacts of health on growth and poverty at the subnational level. Thus, this study is the first at the subnational level, and the findings will be particularly relevant in understanding the role of both health and education capital in accelerating growth and poverty reduction efforts. The empirical findings are broadly encouraging. First, nullifying any doubts on the reliability of Indonesian subnational data, the results suggest that the neoclassical model augmented by both health and education capital provides a fairly good account of cross-district variation in economic growth and poverty in Indonesia. The authors found that the results on conditional convergence, physical capital investment rate, and population growth confirm the theoretical predictions of the augmented neoclassical model. They also found that both health and education capital had a relatively large and statistically significant positive effect on the growth rate of per capita income. Economic growth was found to play a vital role in reducing Indonesian poverty, reinforcing the importance of attaining higher rates of economic growth. Findings from the poverty–human capital model showed that districts with low levels of education are characterized by higher levels of poverty. Regions with mediocre immunization coverage and greater than average prevalence of waterborne diseases had higher poverty rates and lower output per capita. Similarly, regions with higher numbers of births attended by a skilled birth attendant were associated with lower poverty rates and higher economic output. The results in particular suggest that, in designing policies for growth, human development, and poverty reduction, it is necessary to broaden the concept of human capital to include health as well.



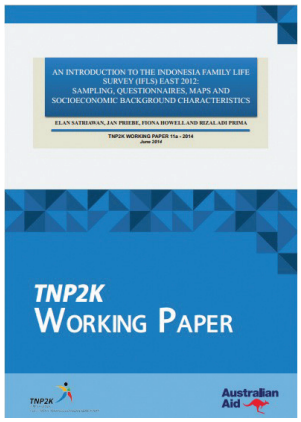
Working Paper 10
Studi Kelompok Masyarakat PNPM
Lampiran Studi Kelompok Masyarakat PNPM

Author : Leni Dharmawan, Indriana Nugraheni dan Ratih Dewayanti, Siti Ruhanawati, Nelti Anggraini

The PNPM Community Groups study was conducted in four villages and two towns. It demonstrates successful programs but also highlights the limitations in terms of adopting PNPM principles and processes.

There is recognition of the expertise of individual actors in managing the project but their influence is limited since each project has its own rules and tends to form new groups instead of utilizing existing ones. Local governments are not obliged to conform to the principles and processes of PNPM outside of the PNPM program.

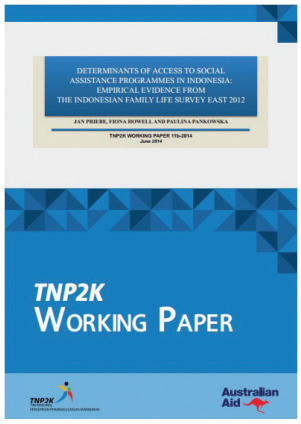
Facilitation does not build collective consciousness in the society to correct any imbalances in authority or power among groups within a community. Groups that implement the project need to be integrated into local institutions and there need to be better checks and balances in place to prevent specific groups from becoming dominant.



Working Paper 11a
An introduction to the Indonesia Family Life Survey IFLS East 2012 : Sampling Questionnaires Maps and Socioeconomic Background Characteristics

Author : Elan Satriawan, Jan Priebe, Fiona Howell and Rizal Adi Prima

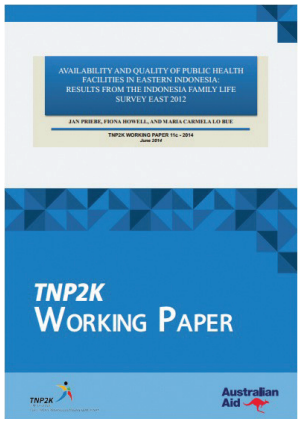
The first round of the Indonesia Family Life Survey (IFLS) East was conducted in Eastern Indonesia in 2012. This paper is intended to provide researchers and policy makers alike an introduction to and brief overview of this new dataset. Topics covered include technical details of survey implementation (sampling procedure, calculation of weights, and field implementation) and a socioeconomic overview using Central Bureau of Statistics (Badan Pusat Statistik or BPS) data and IFLS East data of the prov- inces selected in the region.



Working Paper 11b
Determinants of Access to Social Assistance Programmes in Indonesia Empirical Evidence from the Indonesian Family Life Survey East 2012

Author :Jan Priebe, Fiona Howell and Paulina Pankowska

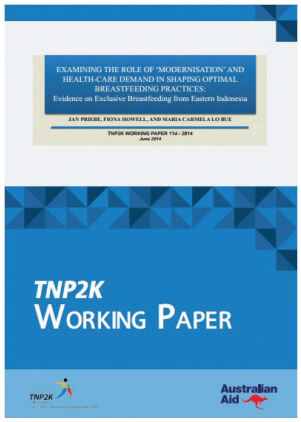
In the past 15 years, the Government of Indonesia has implemented a variety of social assistance programmes intended to improve the lives of the poor and help them escape poverty. Many of these programmes are now operating at a national scale and cover millions of Indonesians. Using a new household survey dataset that covers the eastern areas of Indonesia (Indonesian Family Life Survey East 2012), this paper investigates the household-level determinants of access to social assistance programmes. The analysis reveals that social assistance programmes are relatively more available in poorer provinces and that poorer households—all things being equal—are more likely to access social assistance programmes than nonpoor households, which suggests that social assistance programmes in eastern Indonesia are successful in their efforts to target the poor (poverty targeting), both across regions and households. However, poverty targeting still has scope for improvement in terms of accuracy. Besides the poverty status (as measured in per capita consumption expenditures), the authors found that several other factors influence programme access. Having a disabled household member or having a household head who is a widow(er) appears to increase the likelihood of receiving social assistance programmes. Likewise, the level of trust and conflict in a community affects access to social assistance programmes. Particularly in the case of Raskin, the authors found that the programme is distributed more widely among those communities that are characterized by higher levels of conflict and lower levels of trust. The authors did not find that poor access to infrastructure and remoteness influences household access to social assistance programmes once they controlled for province fixed effects in the regression framework. Furthermore, the findings suggest that possession of a local ‘poverty letter’ strongly improves household access to social assistance programmes, even after controlling for a wide set of socioeconomic characteristics. In general, determinants of programme access differ significantly among provinces and between rural and urban areas.



Working Paper 11c
Availability and Quality of Public Health Facilities in Eastern Indonesia : Results from the Indonesia Family Life Survey East 2012

Author: Jan Priebe, Fiona Howell and Maria Carmela Lo Bue

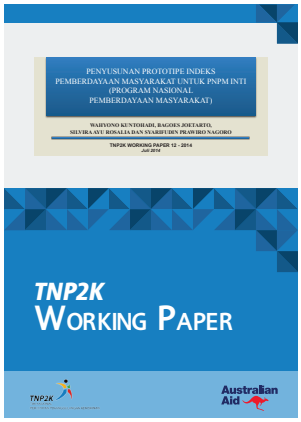
Little is known about public health-care supply in Eastern Indonesia, a region that shows worse health outcomes than the rest of the country. Drawing on a new dataset (IFLS East 2012), this paper examines the availability and quality of public health-care facilities (puskesmas and posyandu) in Eastern Indonesia. The findings suggest that public health-care supply plays a larger and more important role in Eastern Indonesia compared with Western Indonesia. However, this stronger reliance and dependence on public health-care provision has not necessarily resulted in quality health-care supply. Although significant improvements have been achieved over time, the authors found that many puskesmas and posyandu could benefit from more and better-trained staff (education, training, availability, absenteeism) and better physical endowment (infrastructure, medical equipment, and medications). The results further suggest that remarkable differences in the provision of health care exist between urban and rural areas; urban areas have on average better-equipped puskesmas, whereas rural areas seem to have better-equipped posyandu. Furthermore, the authors found that direct funds from the central level (central government funds and Jamkesmas), despite the decentralization process, play a major role in financing the operations of public health facilities. In rural Eastern Indonesia, these central-level funds constitute about 80 percent of the total operational budget of a puskesmas.



Working Paper 11d
Examining the Role of Modernisation and Healthcare Demand in Shaping Optimal Breastfeeding Practices: Evidence on Exclusive Breastfeeding from Eastern Indonesia

Author: Jan Priebe, Fiona Howell and Maria Carmela Lo Bue

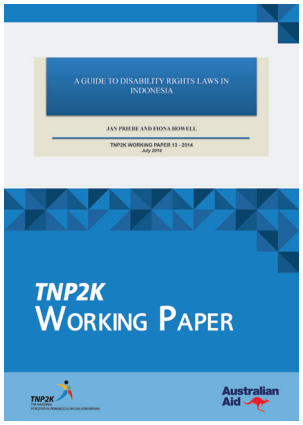
The health benefits to mothers and children in adopting optimal breastfeeding practices are well recognized. However, despite many efforts to promote optimal breastfeeding practices in developing countries, only modest progress has been achieved in past decades. This paper attempts to fill several important research gaps on the socioeconomic determinants of optimal breastfeeding. In contrast to previous studies that have focused on the timely initiation and duration of breastfeeding, this article examines exclusive breastfeeding practices. Using a new data set from Eastern Indonesia, the authors revisited the 'modernisation' hypothesis and, as a first study in this field, investigated to what extent health-care demand and supply factors influence optimal breastfeeding behaviours. Controlling for a wide range of individual, household, and community characteristics, the findings suggest that mothers' labour market participation under 'modern' employment contracts negatively affects optimal exclusive breastfeeding practices, and hence provide support for the 'modernisation' hypothesis. Moreover, the results indicate that a higher availability and quality of health-care supply does not necessarily lead to better breastfeeding practices. Only when health-care supply was matched with a significant demand for such services, did the authors observe a higher chance for optimal exclusive breastfeeding



Working Paper 12
Penyusunan Prototipe Indeks Pemberdayaan Masyarakat untuk PNPM Inti (Program Nasional Pemberdayaan Masyarakat)

Author: Wahyono Kuntohadi, Bagoes Joetarto, Silvira Ayu Rosalia and Syarifudin Prawiro Nagoro

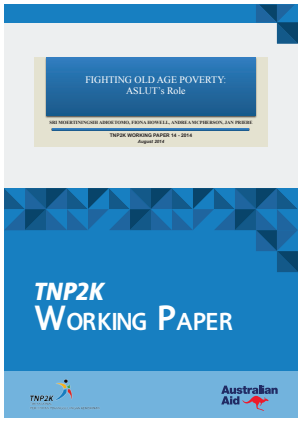
PNPM is a national program for community driven development and poverty reduction. To date the program has used output-based performance indicators for evaluation purposes. An index that effectively demonstrates the performance of the community empowerment process has not been used yet. An effective index is needed to monitor and evaluate activities given the large number of participants, the gradual empowerment process, and the tight schedules for field validation.



Working Paper 13
A Guide to Disability Rights Laws in Indonesia

Author: Jan Priebe, Fiona Howell

In the past few decades, the Government of Indonesia has passed and signed a substantial number of domestic laws and international conventions/treaties that deal with the rights and opportunities of persons with disabilities (PWDs). Disability is a cross-cutting issue and requires an extensive review and monitoring of multiple pieces of legislation that have already been passed in or ratified by Indonesia. In this context, the objective of this report is to provide an overview for a broad audience of the crucial elements of the Indonesian legal framework on PWDs' rights.



Working Paper 14
Fighting Old Age Poverty: ASLUT's Role

Author:Sri Moertiningsih Adioetomo, Fiona Howell, Andrea Mcpherson, Jan Priebe

Indonesia has undergone a demographic transition since the 1970s that has led to significant changes in the population age structure. Life expectancy increased from 45 years to 67 years. The number of elderly people (60 years and above) rose from about 5 million in 1970 to 18 million in 2010, and is projected to increase to over 80 million by 2050. The economic situation of the elderly is precarious. In 2012, 12.65 percent of older people (60 years and above) lived below the official poverty line. Older people, especially those aged 70 and above, have the highest poverty rate among all population groups, 14.92 percent. At the same time, a much greater proportion of the elderly population officially classified as poor is vulnerable to falling into poverty. Currently, the coverage of existing pension schemes for the elderly is very low. The proportion of older people in receipt of civil service and military pension schemes, the only formally available pensions in Indonesia, was 15.5 percent of the population aged 60 years and above in 2010. These pension benefits, available to government workers, civil servants, military personnel and formal sector employees only, are usually insufficient to cover the basic needs of retirees. The Government of Indonesia has recognised these gaps in the social insurance schemes and is taking actions to improve pension coverage.

ASLUT, the current social assistance programme targeted directly at the elderly, started in 2006 in six provinces targeting 2,500 beneficiaries. It has subsequently expanded to all 34 provinces and increased the number of recipients to 26,500 beneficiaries in 2013. Fighting old-age poverty: The role of ASLUT examines empirically, both quantitatively and qualitatively, the socio-economic conditions of poor elderly persons in Indonesia. In contrast to other reports, a particular focus is given to investigating the operations of ASLUT, Indonesia's only targeted cash transfer programme for the elderly. By doing so, the report draws on a unique household survey of 2,200 elderly households from 11 provinces which was conducted by SurveyMETER and the Demographic Institute of the University of Indonesia on behalf of TNP2K in 2012.

This study analyses the relative efficiency of district public health and education service delivery in Indonesia over the period 2003 to 2008. The authors production frontier models to assess the efficiency of districts in achieving education and health outputs, and costs functions to assess the efficiency of public spending. The analysis combines data from the Ministry of Finance on district spending, Susenas household surveys, and health and education infrastructure indicators from the PODES village census.

The data show a strong increase in district health and education public spending, as well as service availability. Yet, the authors also see a large disparity in spending between districts in terms of per capita public spending, both within and between regions. To a large extent this is driven by relatively static characteristics of districts. However, there is some evidence of convergence in spending levels as well as scope for local policy changes to overcome initial public spending differences. This suggests that the central government transfers remain an important policy tool for equalizing investment in health and education in districts.

The analysis reveals substantial variation in efficiency across regions in Indonesia. Given the level of service delivery, district public spending per capita is on average relatively low in Java and Bali. In contrast, Sulawesi and Kalimantan are relatively less efficient in terms of spending, while in Sumatra spending efficiency by district governments has declined strongly since 2006. Districts in Java and Bali also perform well in terms of technical efficiency, as service delivery in these districts is relatively high, given the level of spending and available infrastructure.

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